Volume 6
1973
Pages L1–386, 1–2731

Journal of Physics B

Atomic and Molecular Physics

A Europhysics Journal
published by
The Institute of Physics

Copyright © 1973 by The Institute of Physics and individual contributors. All rights reserved. Multiple copying of the contents or parts thereof without permission is in breach of copyright, but permission is hereby given to copy titles and abstracts of papers and names of authors. Permission is usually given upon written application to the Institute to copy illustrations and short extracts from the text of individual contributions, provided that the source (and, where appropriate, the copyright) is acknowledged.

Published by The Institute of Physics, 47 Belgrave Square, London SW1X 8QX, in conjunction with the American Institute of Physics.

Printed in Great Britain by J W Arrowsmith Ltd. Set in 10/12 pt Times New Roman.

Journal of Physics B: Atomic and Molecular Physics

Honorary Editor

Professor M J Seaton PhD FRS

Editorial Board

R F Barrow DPhil
Professor B H Bransden PhD
Professor P G Burke PhD
Professor K Dressler
Professor J H Hasted MA DPhil
Dr D Husain PhD
Dr P F A Klinkenberg
H G Kuhn MA DPhil FInstP
Professor I M Mills DPhil
A N Prasad PhD
P G H Sandars MA DPhil
Professor G W Series MA DPhil FRS *Deputy Chairman*

Managing Editor

D G Fisher PhD FInstP

Assistant Editor

R D Kershaw BSc

BLANK
PAGE

Contents

NO 1 JANUARY 1973

LETTERS TO THE EDITOR

Effect of nuclear symmetry in ^{4}He on ^{4}He and ^{3}He on ^{3}He collisions at moderate energies — *D Dhuicq, J Baudon and M Barat* — L1

Temperature determination from the relative line-to-continuum intensity of the He II 4686 and 3203 lines — *A Delcroix and S Volonte* — L4

Detachment cross sections for He^- ions — *R Snyder* — L8

PAPERS

A perturbation analysis of current methods of calculating relativistic energies — *A M Ermolaev and M Jones* — 1

Relativistic contributions to screening ratios in europium — *M A Coulthard* — 23

Autoionization states in the photoionization of neon — *T M Luke* — 30

Collective effects in atomic photoabsorption spectra: III. Collective resonance in the $4d^{10}$ shell in Xe — *G Wendin* — 42

Theoretical oscillator strengths for the beryllium $1s^22s^2\ ^1S–1s^2\ 2s2p\ ^1P^0$, $1s^22s2p\ ^1P^0–1s^22p^2\ ^1D$ and $1s^22s2p\ ^1P^0–1s^2\ 2p^2\ ^1S$ isoelectronic sequences — *C A Nicolaides, D R Beck and O Sinanoglu* — 62

Stark effect in the Li hyperfine structure — *U Kaldor* — 71

Absolute line strengths by analysis of Lu–Fano plots with application to excited state transitions in neon — *A F Starace* — 76

Classical cross sections for collisions between electrons and hydrogen atoms at intermediate energies — *I C Percival* — 93

A theoretical study of fast proton-atomic hydrogen scattering — *D Baye and P-H Heenen* — 105

Charge transfer into excited states in thermal energy collisions — *A R Turner-Smith, J M Green and C E Webb* — 114

Simplified model for the scattering of zero energy electrons by helium atoms — *S K Houston* — 131

Variational calculations of the positron-helium scattering length using approximate target wavefunctions — *S K Houston* — 136

Measurements of cross sections for the ionization of Ba^+ by energy resolved electrons — *B Peart, J G Stevenson and K T Dolder* — 146

Ab initio study of Cu_2 and Cu_2^+ — *P Joyes and M Leleyter* — 150

The Franck–Condon principle for polyatomic molecules — *N J D Lucas* — 155

Collinear collision of an atom and a morse oscillator: exact quantum mechanical results — *A P Clark and A S Dickinson* — 164

Formation of HCO^+ by the associative ionization of CH + O — *M MacGregor and R S Berry* — 181

Double charge transfer spectroscopy of diatomic molecules — *J Appell, J Durup, F C Fehsenfeld and P Fournier* — 197

The linewidth of rotational transitions of OCS, CHF_3 and OCS-CHF_3 mixtures — *D S Olson, C O Britt, V Prakash and J E Boggs* — 206

Experimental investigations of ionization growth in nitrogen: I — *M A Folkard and S C Haydon* — 214

Experimental investigations of ionization growth in nitrogen: II — *S C Haydon and O M Williams* — 227

The emission spectrum of yttrium VI — *M S Z Ckaghtai, Z Ali and S Khatoon* — 232

Corrigenda — 240

NO 2 FEBRUARY 1973

LETTERS TO THE EDITOR

Charge exchange in Li^+–He collisions — *C Lesech, R McCarroll and J Baudon* — L11

The least squares method applied to scattering problems *F H Read and J R Soto-Montiel* L15
Dependence of symmetrical charge transfer cross section on ionization potential *D P Dewangan* L20
Dipole and quadrupole three-body interactions in argon *R E Caligaris and A E Rodriguez* L24
Spectre d'excitation du méthane par impact électronique. Observation de vibrations particulières entre 1, 5 et 3 eV *E Manguelle Dicoum, Fr Tran Minh et J Bensimon* L27

PAPERS

Misalignment effects in magnetic resonance *D T Pegg* 241
Semi-classical model of magnetic resonance in intense RF fields *D T Pegg* 246
A comparison of the second Born approximation using plane-wave and final-state Green functions *A R Holt and B Santoso* 254
Double ionization by electron impact: I. General theory *R J Tweed* 259
Double ionization by electron impact: II. Calculations of cross sections for H^-, He and Li^+ *R J Tweed* 270
Threshold behaviour of e–H collisional excitation function: classical treatment *P Grujić* 286
Elastic scattering of slow electrons by helium *M Knowles and M R C McDowell* 300
Two-photon ionization of Li, Na and K with polarized photons *J Mizuno* 314
Electron scattering by atomic hydrogen using a pseudo-state expansion: IV. The convergence of the S-state expansion at intermediate energies *P G Burke and J F B Mitchell* 320
Simple analytical wavefunctions for the ions of the iron group elements *J Kollár and G Solt* 329
Inelastic collision of fast charged particles with arbitrary levelled hydrogen-like atoms *K Omidvar and A H Khateeb* 341
Experimental and theoretical studies on non-adiabatic ion dynamic contributions to the He I 4026 2^3P–5^3D, 5^3F profile at low electron densities *R Mahon, R W Lee and D D Burgess* 354
Dissociative photoionization of H_2 and D_2 through the $1s\sigma_g$ ionic state *R Browning and H Fryar* 364
The binary diffusion coefficient of moderately dense gas mixtures *W A Wakeham* 372
The stopping power of organic liquids for alpha particles over the energy range 1–8 MeV *R B J Palmer* 384

NO 3 MARCH 1973

LETTERS TO THE EDITOR

Calculated photoionization cross sections for Be and Mg *J Dubau and J Wells* L31
Coulomb effects in the final state of an ionizing collision between electrons and helium atoms *A Salin* L34
A comment on the momentum translation approximation for the calculation of transition amplitude for high-order electromagnetic transitions *B J Choudhury* L37
On the long-range hyperfine shift in HeH *P J Fortune and P R Certain* L39
The optical model for 100 eV elastic electron scattering on argon *J B Furness and I E McCarthy* L24

PAPERS

Transition moment integrals and the hypervirial theorem: II *J C Nash* 393
The second Born approximation for ionization *R J Tweed* 398
A truncation technique for the real time two-particle Green function hierarchy *R W Lee* 406
Multipole relaxation and transfer rates in the impact approximation: application to the resonance interaction *C G Carrington, D N Stacey and J Cooper* 417
The ionization potential and the $4s4p^6nl$ levels of ^{86}Kr I *M S Z Chaghtai and V Hassan* 433
The use of second-order potentials in the theory of the scattering of charged particles by atoms: IV. Electron scattering of helium atoms *K A Berrington, B H Bransden and J P Coleman* 436
Collisions of fast electrons with helium: III. Excitation of the $(1s, nd)^1D$ and $(ns, np)^1P$ states *M J Woolings and M R C McDowell* 450
Mean energy loss per ion pair and stopping power of helium gas for electrons *B L Jhanwar and S P Khare* 462
Electron capture and excitation in He^{++}–He collisions *S C Mukherjee, K Roy and N C Sil* 467
Spin polarization by electron resonance scattering from neon *T Heindorff, J Hofft and E Reichert* 477

Excitation of helium by 20–100 keV hydrogen atoms — *W G F Blair and H B Gilbody* 483
Ionization processes in slow collisions of heavy particles: II. Symmetrical systems of the rare gases He, Ne, Ar, Kr — *G Gerber, R Morgenstern and A Niehaus* 493
Variational approximation to the $2p\sigma_u$ and $2p\pi_u$ wavefunctions of the hydrogen molecule ion — *N R Arista and V H Ponce* 511
Molecular orbital calculations for close atomic collisions: the N_2 system — *J S Briggs and M R Hayns* 514
A new electronic transition $F^2\Sigma^+ - A^2\Pi_i$ of AlO — *M Singh* 521
Harmonic oscillator integrals — *W Witschel* 527
Variational calculations of correlated wavefunctions and energies for ground, low-lying as well as highly excited discrete states in many-electron atoms using a new atomic structure theory including electron correlation — *C A Nicolaides and D R Beck* 535
Multiphoton transitions: IV. Bound-free transition integrals in compact forms — *F H M Faisal* 553
Bound-free transitions in electromagnetic field of arbitrary intensity — *N K Rahman and F H M Faisal* 559
The production of characteristic x rays by proton bombardment, and the ratio of characteristic to continuous radiation — *N A Dyson* 562
Coster–Kronig and fluorescence yields for the L_2 and L_3 subshells in the high-Z region — *J C McGeorge, D W Nix and R W Fink* 573
Corrigenda 584

NO 4 APRIL 1973

LETTERS TO THE EDITOR

Approximation to the method of local orbitals — *A B Kunz* L47
The spin density of the ns^2S states in the lithium isoelectronic sequence — *A L Stewart* L51
A unified calculation on the Stark broadened profile of Lyman-alpha — *C Bottcher* L54
Photoionization resonance profile parameters of the $3s3p\ ^1P_1$ two-electron excitation in He I — *P Dhez and D L Ederer* L59
Autoionizing transitions in N_2 and H_2 produced by electron impact — *P J Hicks, J Comer and F H Read* L65
Observation of the effects of rotational transitions in the resonant scattering of electrons from N_2 — *J Comer and M Harrison* L70
Isotope effects in the predissociation of the $c\ ^2\Sigma_u^+$ state of N_2^+ — *T R Govers, C A van de Runstraat and F J de Heer* L73
Isotope shift of ^{20}Ne, ^{21}Ne and ^{22}Ne and hyperfine structure of ^{21}Ne in the lines 6096 Å and 6074 Å of neon I — *R-J Champeau and J-C Keller* L76
Observations of stimulated anti-Stokes radiation in barium vapour — *J L Carlsten and T J McIlrath* L80
A note on the theory of the flowing afterglow — *H M P Stock* L86
Multiple absorption of laser photons by atoms — *F H M Faisal* L89
Circular versus linear polarization in multiphoton ionization of hydrogen — *R N DeWitt* L93

PAPERS

Quasi-Landau spectrum of a hydrogen like atom in a high magnetic field — *A F Starace* 585
On second-order magnetic hyperfine interactions in one-electron atoms: connections between the Schrödinger, Dirac and quantum electrodynamical perturbation calculations — *E Latvamaa, L Kurittu, P Pyykko and L Tataru* 591
A derivation of general open-shell SCF equations for atoms and molecules with a Green function method — *R Albat and N Gruen* 601
Asymptotic solutions of the coupled equations of electron-atom collision theory for the case of some channels closed — *D W Norcross and M J Seaton* 614
Inelastic scattering of electrons and protons by atoms at intermediate energies — *C J Joachain and R Vanderpoorten* 622
Classical treatment of fast atomic collisions — *D R Bates and R Snyder* 642
The photoionization cross section of magnesium near threshold — *G N Bates and P L Altick* 653
Electron-molecule collision ionization in hydrogen and deuterium — *I R Cowling and J Fletcher* 665
Differential scattering cross section for excitation in He^+Ne collisions — *C Gaussorgues* 675

The elastic small angle scattering of ions at atoms in the high energy region: I. Theoretical results *H-J Beier* 683
Production of large numbers of atoms in selected excited state by laser optical pumping: calcium *T J McIlrath and J L Carlsten* 697
Terms of N VI and O VII *S C Baker* 709
Measurements of excitation rate coefficients for some Ne VIII lines *G N Haddad and R W P McWhirter* 715
Monte-Carlo investigations of the motion of gaseous ions in electrostatic fields *H R Skullerud* 728
Microwave pressure boradening studies of some molecules *G P Srivastava, H O Gautam and Anil Kumar* 743
On the emission spectrum of molecular SbF *M Chakravorty, K C Abraham and M M Patel* 757

NO 5 MAY 1973

LETTERS TO THE EDITOR

A comment on 'The multipole hamiltonian for time dependent fields' *R G Woolley* L97
On the validity of momentum translation approximation *B J Choudhury* L100
Low intensity and high intensity limits of the momentum translation approximation *B J Choudhury* L103
Effect of u–g symmetry on direct and exchange excitations in ion–atom scattering *M Barat, J C Brenot and J Pommier* L105
Chemiionization in collisions of He(2^3S) and He(2^1S) metastable atoms with H and H_2 *J S Howard, J P Riola, R D Rundel and R F Stebbings* L109
Calculation of cross sections for chemiionization of H by He(2^1S) and He(2^3S) metastable atoms *J S Cohen and N F Lane* L113
Continuous-wave laser oscillation in singly ionized arsenic *J A Piper and C E Webb* L116
The electronic transition moment of the $N_2^+(B^2\Sigma_u^+ \rightarrow X^2\Sigma_g^+)$ system *L C Lee and D L Judge* L121
Observation of chlorine Kα satellite and hypersatellite and Kβ satellite transitions *C F Moore and H Wolter* L124

PAPERS

On a geometrical realization of the Aufbau scheme *M Berrondo and O A Novaro* 761
Excited state wavefunctions for helium *R J Tweed* 770
Coulomb hole in some excited states of helium *R J Boyd and C A Coulson* 782
Time-reversal in the impact parameter method *R Shakeshaft, J Macek and E Gerjuoy* 794
Application of the momentum translation method to multiphoton ionization of hydrogen by intense electromagnetic fields *R N DeWitt* 803
Multiphoton ionization of hydrogen atom in intense laser beam *Man Mohan and R K Thareja* 809
Application of classical collision theory to electron impact double ionization of atoms *B N Roy and D K Rai* 816
Excitation of highly excited hydrogenic ions and atoms by charged particles: IV *D Richards* 823
The use of second order potentials in the theory of scattering of charged particles by atoms: V. Excitation of helium atoms by fast protons and charge exchange *S Begum, B H Bransden and J Coleman* 837
Vacancy occupation probabilities in ion-atom collisions *J H Macek and J S Briggs* 841
Classical theory of elastic scattering and vibro-rotational dissociation in N_2^+ on He collisions at moderate energies (0·5 keV–3 keV) *J Baudon* 850
Electron impact excitation of N_2: I. Resonant phenomena associated with the A $^3\Sigma_u^+$ and B $^3\Pi_g$ valence states *J Mazeau, F Gresteau, R I Hall, G Joyez and J Reinhardt* 862
Electron excitation of N_2: II. Resonant phenomena associated with Rydberg states *J Mazeau, R I Hall, G Joyez, M Landau and J Reinhardt* 873
Energy levels in linear molecules: II *P R Scott, J Raftery and W G Richards* 881
Diffusion coefficients for n-alkanes in binary gaseous mixtures with nitrogen *W A Wakeham and D H Slater* 886
Measurements of integral total cross sections for CsF on Ar, Kr, Xe *R David, W Spoden and J P Toennies* 897

Electron mobility and localization in dense He^4 gas
H R Harrison, L M Sander and B E Springett 908
Mobility, diffusion and interaction potential for potassium ions in argon *H R Skullerud* 918
Decay of a high temperature helium plasma: validity of local thermodynamic equilibrium and estimation of recombination coefficients for He^{++}, He^+ and He_2^+ *D E Roberts* 929

NO 6 JUNE 1973

LETTERS TO THE EDITOR

Oscillator strengths in the beryllium sequence *A Hibbert* L127
Relation d'incertitude et théorie des perturbations *B Tsapline* L131
The differential cross section for elastic scattering of electrons from atomic hydrogen
P J O Teubner, C R Lloyd and E Weigold L134
Autoionizing states in argon *J W McConkey and J A Preston* L138
Operator expectation values in 1/Z perturbation theory *J Killingbeck* L142
On particular aspects of the competition between stimulated emission and absorption in the 3·36 μm xenon line profile *J Brochard, D Reymann and R Vetter* L145
Photoabsorption coefficients of molecular nitrogen in the 300–700 Å region
W S Watson, J Lang and D T Stewart L148
The effect of small variations in the angle between a magnetic field and the discharge tube axis on a rare gas afterglow decay *T L Dutt* L152
High resolution $L_{2,3}M_{2,3}M_{2,3}$ Auger electron spectra of argon
T Kondow, T Kawai, K Kunimori, T Onishi and K Tamaru L156

PAPERS

Calculation of the dynamic dipole polarizabilities and Van der Waals coefficients of beryllium and carbon atoms in the ground state *W D Robb* 945
Correlated radial momentum distributions $I(p)$ and Compton profiles $J(q)$. The (^1S) Be and (^1S) Ne atoms ground states *M Naon and M Cornille* 954
Translational factors in eikonal approximation and their effect on channel couplings
J C Y Chen, V H Ponce and K M Watson 965
A scaling law for inner-shell excitation cross sections in ion–atom collisions
J S Briggs and J H Macek 982
Electron detachment from negative ions by charged particle collision: I. Proton impact
R Gayet, R K Janev and A Salin 993
Electron scattering by Li, Na, and K in the frozen core Glauber approximation *H R J Walters* 1003
Electron capture from hydrogen and helium atoms by fast alpha particles *Dž S Belkić and R K Janev* 1020
The role of many-electron correlations in fast electron–atom inelastic collisions
M Ya Amusia, N A Cherepkov, R K Janev, S I Sheftel and Dj Živanović 1028
Comparison of binary-encounter and Born approximation for incident neutral systems
J H Harberger, R E Johnson and J W Boring 1040
A theoretical study of the effects of ion motion on spectral lines in plasmas: I. Neutral helium lines
R W Lee 1044
A theoretical study of the effects of ion motion on spectral lines in plasmas: II. Hydrogen–H_β
R W Lee 1060
Collisional detachment from atmospheric negative ions *R Ranjan and C C Goodyear* 1070
An experimental determination of the Rydberg constant
B P Kibble, W R C Rowley, R E Shawyer and G W Series 1079
The Stark effect in hydrogen and precision measurements of the Rydberg constant
J A Blackman and G W Series 1090
Saturation effects in RF spectroscopy: III. Mixing of nearly degenerate levels by strong off-resonant fields *S Stenholm* 1097
Metastable densities and excitation processes in the He-Cd laser discharge
P G Browne and M H Dunn 1103
Measurements of the thermal diffusion coefficient for electrons in helium
D K Gibson, R W Crompton and G Cavalleri 1118

Measurements of magnetized rare gas afterglow plasmas in the frequency range 200–1500 MHz
T L Dutt 1129
The mobility of potassium ions in gas mixtures *H B Milloy and R E Robson* 1139

NO 7 JULY 1973

LETTERS TO THE EDITOR

Classical free-fall atomic model *D R Bates and R Snyder* L159
Low energy scattering of electrons by cesium atoms *P G Burke and J F B Mitchell* L161
The capture amplitude for the ionization of He by electron impact
D H Phillips and M R C McDowell L165
Difficulties with the Faddeev–Watson multiple scattering expansion in atomic physics
F W Byron Jr and C J Joachain L169
On the anomaly in the cross sections for electron loss and capture by multiply charged ions in neon
Yu S Volodyagin, I S Dmitriev, V S Nikolaev, Yu A Tashaev and Ya A Teplova L171
On the analysis of unresolved inelastic energy loss spectra in ion–atom collisions
J D Garcia and R J Fortner L174
Ar^+–Ar momentum transfer cross sections in the range 4–7 eV *J J B Frommelt and I R Jones* L178
Influence of photon statistics on the Bloch-Siegert shift *L Armstrong Jr and S Feneuille* L182
Dynamique des hydrogènes dans les liaisons hydrogène des dimères de l'acide acétique
Y Marechal L188

PAPERS

A modified correspondence principle for strongly coupled states *A P Clark* 1153
The relativistic theory of the angular distribution of photoelectrons in *jj* coupling
T E H Walker and J T Waber 1165
The calculation of resonances in electron–ion scattering using the distorted wave approximation
M D Hershkowitz and M J Seaton 1176
One centre molecular study of the single ionization of He by He^+ impact at moderate energy
V Sidis 1188
Ionization processes in He–He collisions *M Barat, D Dhuicq, R François, C Lesech and R McCarroll* 1206
Simultaneous multiphoton ionization and excitation of helium in an intense laser beam *Man Mohan* 1218
Photoionization of the 1^1S state of helium *K L Bell, A E Kingston and I R Taylor* 1228
Destruction of fast metastable hydrogen atoms passing through atomic helium
K L Bell, A E Kingston and W A McIlveen 1237
Formation of H(2s) and H(2p) in collisions of atomic hydrogen with atomic helium
K L Bell, A E Kingston and W A McIlveen 1246
A theoretical study of proton–helium scattering *D Baye and P-H Heenen* 1255
Excitation of helium in He^+–He and He–He collisions: the influence of metastable helium atoms
W G F Blair, R W McCullough, F R Simpson and H B Gilbody 1265
Electron-loss cross sections of lithium atoms in gases *E H Pedersen and P Hvelplund* 1277
Calculation of relative oscillator strengths of spectral lines from atomic self-absorption data
A S Farghaly 1288
Spin-orbit coupling and the interaction of molecules with the radiation field
L D Barron and A D Buckingham 1295
Prediction of a predissociation in the $A^2\Sigma^+$ states of HCl^+ and DCl^+
J Raftery and W G Richards 1301
Méthode d'analyse des perturbations par paire dans les spectres électroniques: application aux spectres de AsO et de LuO *J N Massot, J P Goure et J Figuet* 1308
On the dielectric second virial coefficient of polar gases *K K Datta and A K Barua* 1327
Measured lifetimes of the two vibrational levels of the $b^3\Sigma^+$ state of CO
A J Smith, R E Imhof and F H Read 1333
A new electronic transition $F^1\Pi$–$X^1\Sigma$ of MgO *M Singh* 1339
A band system of the SrI molecule in the region 13350–13560 Å
S G Shah, M M Patel and A B Darji 1344

The importance of electronic correlations for the calculation of x ray and fast electron scattering by Be, B, C, N, O, F: II *M Naon and M Cornille* 1347

NO 8 AUGUST 1973

LETTERS TO THE EDITOR

Relationship between the Coulomb and hydrogenic approximations for $\langle r^k \rangle$ *A Szabo and S A Adelman* L193
On the dissociation of the H_2 molecule following electron impact and leading to the obtention of atomic hydrogen in the $n = 3$ levels *L Julien, M Glass-Maujean and J P Descoubes* L196
The measurement of total cross sections for positrons of energies 2–400 eV in He, Ne, Ar, and Kr *K F Canter, P G Coleman, T C Griffith and G R Heyland* L201
The (e, 2e) experiment as a probe for atomic structure *J B Furness and I E McCarthy* L204
Resonances in low energy electron-mercury scattering *M Dŭweke, N Kirchner, E Reichert and E Staudt* L208
Configuration interaction studies of the low-lying quartet states of N_2^+ *A Andersen and E W Thulstrup* L211
A quantum calculation of the higher order terms in the Bloch–Siegert shift *C Cohen-Tannoudji, J Dupont-Roc and C Fabre* L214
An experimental check of higher order terms in the radiative shift of a coherence resonance *C Cohen-Tannoudji, J Dupont-Roc and C Fabre* L218
Analytical expressions for the Bloch–Siegert shift *P Hannaford, D T Pegg and G W Series* L222
New emission spectrum of carbon monoselenide *J Lebreton, G Rosser and L Marsigny* L226

PAPERS

Equivalence of wave and impact parameter Born expansions *R Shakeshaft* 1357
The rate of convergence of the Fredholm method *M B Hidalgo, J Nuttall and R W Stagat* 1364
Asymptotic expansion of the wavefunction for e–H scattering *M B Hidalgo, J Nuttall and R W Stagat* 1371
A simple perturbation-variational calculation for $1s^2\ ^1S$ *J Killingbeck* 1376
The first-order Hartree–Fock equations for the $nsns\ ^1S$ states of helium-like ions *I Rebelo* 1382
LS-term dependence of Slater integrals in $p^n p'$ configurations: I. Hartree–Fock calculations for individual terms of the $np^5n'p$ configurations in the Ne I and Ar I isoelectronic sequences *J E Hansen* 1387
Potential scattering cross sections in the semiclassical limit *K E Mount* 1397
Virtual orbitals, excitation energies, and oscillator strengths *N Björnd* 1412
Perturbed symmetric resonance; an exact formula *D S F Crothers* 1418
Detailed balance as a check on impact parameter calculations *H Tai and E Gerjuoy* 1426
On the polarization of the resonance lines of lithium and sodium atoms by electron impact *A N Tripathi, K C Mathur and S K Joshi* 1431
Electron impact excitation of H and He^+: I. $1s \rightarrow ns$ transitions *M R C McDowell, L A Morgan and P Myerscough* 1435
Quantum defect theory: X photoionization *J Dubau and J Wells* 1452
Polarization phenomena in multiphoton ionization of atoms *V L Jacobs* 1461
Hund's coupling case (c) in diatomic molecules: I. Theory *L Veseth* 1473
Hund's coupling case (c) in diatomic molecules: II. Examples *L Veseth* 1484
Measurements which indicate the existence of a second short-lived state of H^{2-} *B Peart and K T Dolder* 1497
The band spectrum of SrI in the region λ6500–λ7200 Å *Ashrafunnisa, D V K Rao and P T Rao* 1503
Nuclear spin analogue of a molecular beam maser with cavities in series *W H U Krause and D C Laine* 1510
Electron temperature and ionization state in laser produced plasmas *T P Donaldson, R. J. Hutcheon and M H Key* 1525
Collisional excitation and destruction of excited Zn II levels in a helium afterglow *J M Green, G J Collins and C E Webb* 1545
Krypton M-shell Auger and Coster–Kronig electron energies *F P Larkins* 1556
Stark broadening of high quantum number $\Delta n = 1$ transitions of carbon V and VI in a laser-produced plasma *F E Irons* 1562

Analysis of the time-profiles of transient absorption observed in the kinetic spectrophotometry of aromatic hydrocarbons *K A Hodgkinson and I H Munro* 1582
Lyman x rays from a highly stripped nitrogen beam *C F Moore, W J Braithwaite and D L Matthews* 1592
Excited state absorption spectroscopy of alkaline earths selectively pumped by tunable dye lasers: I. Barium arc spectra *D J Bradley, P Ewart, J V Nicholas and J R D Shaw* 1594
Studies of the quadratic Zeeman effect: I. Application of the sturmian functions *A R Edmonds* 1603
A note on the equivalence of the classical motion of rigid bodies with prescribed angular velocities and the quantum mechanical solutions for paramagnetic atoms in external fields *F Ansbacher* 1616
A unitary perturbation method for a paramagnetic atom in a magnetic field with constant and oscillatory components *F Ansbacher* 1620
An improved coordinate transformation for the treatment of a paramagnetic atom in a linear oscillatory and a constant transverse magnetic field *F Ansbacher* 1633
Saturation effect in RF spectroscopy for transverse optical pumping *N Tsukada and T Ogawa* 1643
Quantum theory of RF resonances: the semiclassical limit *S Stenholm* 1650
Further analyses of the emission spectra of arsenic monoxide AsO *V M Anderson and J H Callomon* 1664
Calculations of state functions behind ionizing shock-waves in potassium and caesium vapour *R M Hill and E M Jones* 1685

NO 9 SEPTEMBER 1973

LETTERS TO THE EDITOR

Regular and irregular spectra *I C Percival* L229
Potential energy curves and spectroscopic constants for some diatomic systems *D J Ellis, K B Banyard, A D Tait and M Dixon* L233
Single excitation in multi configuration wavefunctions: Ground states of the atoms Be to F *F Grein and T C Chang* L237
Power series expansion for the RF resonance shift *S Stenholm* L240
Calculation of electron scattering by neutral oxygen, using an accurate representation for the target *H E Saraph* L243
The use of second order potentials in the theory of scattering of charged particles by atoms. VI. Elastic scattering by hydrogen and helim atoms *K H Winters, C D Clark, B H Bransden and J P Coleman* L247
Inelastic electron–helium scattering at large angles *P S Nicholls and K H Winters* L250
Elastic and 2s, 2p excitation cross sections of hydrogen atom by the Faddeev approach *B C Saha, A S Ghosh and N C Sil* L252
Multichannel effects on the free–free transitions of Li^- at the infra-red threshold *T L John, D J Morgan and A R Williams* L255
Electron impact ionization of neon and argon *J Fletcher and I R Cowling* L258
Photoabsorption cross sections of NO in the 380–660 Å region *A Gardner, M Lynch, D T Stewart and W S Watson* L262
Electron impact excitation and assignment of the low-lying electronic states of CO_2 *R I Hall, A Chutjian and S Trajmar* L264
Translational energy spectrum of O_2^- ions formed by 4 keV O_2^+ ions impacting on argon *F C Fehsenfeld, J Appell, P Fournier and J Durup* L268
Sur la dissociation des ions $CH_nD_{4-n}^+ (n \leqslant 4)$ au cours de collisions avec des atomes de gaz rares *E Constantin et J Ch Abbe* L272

PAPERS

The hydrogen atom as a relativistic elementary particle: I. The wave equation and mass formulae *A O Barut and W Rasmussen* 1695
The hydrogen atom as a relativistic elementary particle: II. Relativistic scattering problems and photo-effect *A O Barut and W Rasmussen* 1713
On the relative accuracies of eigenvalue bounds *C A Coulson and P J Haskins* 1741
LS-term dependence of Slater integrals in $p^n p'$ configurations: II. Deviations from the single-configuration approximation in the $np^6\, n'p$ configurations *J E Hansen* 1751
Correlation effects on specific isotope shifts *J J Labarthe* 1761

Parametric study of isotope shifts in Ne I *J C Keller* 1771
The effect of the electron bound state structure on ionization cross sections in atomic collisions *V S Nikolaev, V S Senashenko and V Yu Shafer* 1779
Variational methods in potential scattering *M R H Rudge* 1788
Evaluation of exchange matrix elements in p–H collision *Hsiang Tai* 1797
Differential cross sections for alkali–halogen collisions from trajectory calculations on intersecting surfaces *R Düren* 1801
Electron detachment from alkali-metal negative ions by electron collisions *T L John and B Williams* 1814
Collision integrals of carbon–oxygen atoms in different electronic states *M Capitelli and E Ficocelli V* 1819
Rotational inelasticity in polar diatom–atom scattering: application of the semi-classical time-dependent perturbation theory to the Ne–CO and Ne–HCl systems *S Saha, E Guha and A K Barua* 1824
Ion spectra from slow collisions of He^+ with He, Ne, Ar, and Ne^+ with Ne *G Gerber, A Niehaus and B Steffan* 1836
Measurement of the non-linear Stark effect in hydrogen-like He^+, $n = 4$ *H-J Beyer, H Kleinpoppen and J M Woolsey* 1849
Secondary electron emission by metastable particle impact in ionization growth experiments *S C Haydon and O M Williams* 1856
Secondary ionization by metastable particles in nitrogen *S C Haydon and O M Williams* 1866
Electron radiation temperature measurements in a helium afterglow at 300 K *R Deloche, W E Wells, P Monchicourt and J Berlande* 1881
Measurement of the broadening and shift of the Na D lines by helium at low pressure *J P Deleage, D Kunth, G Testor, F Rostas and E. Roueff* 1892
Fluorescence quenching and nonradiative energy transfer in solutions *A Kawski, E Kuteń and J Kamiński* 1907
The G $^1\Pi$–X $^1\Sigma$ and G $^1\Pi$–A $^1\Pi$ transitions of MgO *M Singh* 1917

NO 10 OCTOBER 1973

LETTERS TO THE EDITOR

The differential cross section for elastic scattering of electrons by H_2 in the first Born approximation *J W Liu and V H Smith, jr* L275
Two-photon ionization of trivalent atoms as a source of polarized electrons *P S Farago and D W Walker* L280
Revised absolute absorption cross section of Ba I at 237·9 nm *J L Carlsten and T J McIlrath* L284
Some energy levels and matrix elements of the three-dimensional quartic oscillator *R P McEachran, A Rotenberg and M Cohen* L286
Potential energy curves of the $(XeH)^+$ system *C Kubach and V Sidis* L289
Molecular orbital studies of hydrogen chloride *H Itoh and H Hinazumi* L294
Satellite spectra for helium-like ions in laser-produced plasmas *N J Peacock, M G Hobby and M Galanti* L298

PAPERS

Use of the Rayleigh–Ritz–Galerkin method with cubic splines for constructing single-particle bound-state radial wavefunctions: The hydrogen atom and its spectrum *B W Shore* 1923
Brillouin's theorem for excited $(nl)^q\,(n'l')^{q'}$ configurations *C Froese Fischer* 1933
Nuclear charge expansion method for $1snl^{1,3}LIIsn'l'^{1,3}L'$ transitions in the helium isoelectronic sequence *C Laughlin* 1942
Transition probabilities in the lithium isoelectronic sequence *C Laughlin, M N Lewis and Z J Horak* 1953
LS-term dependence of Slater integrals in $p^n p'$ configurations: III. Deviations from the single-configuration approximation in the $2p^n 3p$ configurations *J E Hansen* 1967
Calculation of lifetimes for states of Ti II *P Kaijser and J Linderberg* 1975

Two-photon detachment cross section of H^- — *S A Adelman* 1986
Feshbach-type $^3P^e$ autoionizing states of H^- — *E Holøien and J Midtdal* 1992
Analysis of the $2s^2\ ^1S$, $2p^2\ ^1D$ and $2s2p\ ^1P$ autoionizing levels of helium, in proton–helium collisions — *A Bordenave-Montesquieu, A Gleizes, M Rodiere and P Benoit-Cattin* 1997
The Fedholm integral method: II. The calculation of scattering amplitudes for potential scattering — *A R Holt and B Santoso* 2010
Transitions among the $3p^2P$ states of sodium induced by collisions with helium — *R H G Reid* 2018
Many-body theory of the generalized optical potential for electron–atom (molecule) inelastic scattering — *Gy Csanak, H S Taylor and D N Tripathy* 2040
Adiabatic limit and nonadiabatic effects in the second order transition potential: Semi-empirical analysis — *Gy Csanak and H S Taylor* 2055
Elastic and inelastic scattering of Li^+ ions by rare gases (Ne, Ar, Kr, Xe) — *M Barat, D Dhuicq, R François and V Sidis* 2072
Dissociative ionization by electron impact: I. Protons from H_2 — *A Crowe and J W McConkey* 2088
Dissociative ionization by electron impact: II. N^+ and N^{++} from N_2 — *A Crowe and J W McConkey* 2108
Formation of H(2p) and H(2s) atoms in collisions of 2–26 keV protons with hydrogen atoms — *T J Morgan, J Geddes and H B Gilbody* 2118
Theory of collision induced rotational energy transfer in the Π-state of diatomic molecules — *H Klar* 2139
Band strengths for the Co_3^+ ($A\ ^2\Pi_u \rightarrow X\ ^2\Pi_g$) system produced through photoionization excitement of CO_2 — *D L Judge and L C Lee* 2150
An accurate measurement of the natural decay rate of orthopositronium — *P G Coleman and T C Griffith* 2155
Re-examination of the spectrum of strontium: autoionization in the spectrum of neutral strontium — *G H Newsom, S O'Connor and R C M Learner* 2162
New high-gain transitions in neon — *J H Sanders and J E Thomson* 2177
The $M_{4,5}$ spectrum of ^{58}Ce and the γ–α phase transition — *D Ottewell, E A Stewardson and J E Wilson* 2184
X ray decay energies of highly ionized fluorine atoms — *R L Kauffman, C W Woods, F F Hopkins, D O Elliott, K A Jamison and P Richard* 2197
Corrigendum 2204

NO 11 NOVEMBER 1973

LETTERS TO THE EDITOR

The scattering of low energy positrons by helium — *J W Humberston* L305
Comparison of electron emission cross sections from autoionizing states of helium by electron impact and H^+, H_2^+ and He impacts — *N Oda, S Tahira and F Nishimura* L309
Collision of electrons with laser photons in a background potential — *F H M Faisal* L312
Virial theorem in adiabatic representation — *A V Matveenko* L316
Using polarization effects in multiphoton ionization to measure ratios of bound-free matrix elements — *P Lambropoulos* L319
Excitation in fast $He(2^3S)$–$He(1^1S)$ collisions — *R W McCullough, F R Simpson and H B Gilbody* L322
Velocity dependence of the total ionization cross section of Ar atoms by metastable He atoms — *A Pesnelle, H Hourdin, G Watel and C Manus* L326
Inelastic scattering in He + He collisions — *R Morgenstern, M Barat and D C Lorents* L330
Orientation of diamagnetic Cs^+ ions by charge-exchange collisions with optically pumped caesium — *A F Oluwole and E A Togun* L334
Low energy electron impact excitation of autoionizing levels in cadmium vapour — *W R Newell, K J Ross and J B Wickes* L337
Observation of autoionization processes in the production of excited CO_2^+ ions — *R W Carlson, D L Judge and M Ogawa* L343
Argon L-shell fluorescence yields in Ar^+–Ar collisions — *R J Fortner and J D Garcia* L346

PAPERS

Many-body calculations for the heavy atoms: III. Pair correlations — *J C Morrison* 2205

The accurate numerical determination of two- and three-body dispersion forces *R F Stewart* 2213
Some S state energies for He and Li^+ using a simple correlated trial function *P J Haskins* 2220
Relativistic Hartree–Fock calculations of some properties of rare earth atoms and ions *M A Coulthard* 2224
Combined theory of classical excitation of atoms by charged particles *I C Percival* 2236
Atomic polarizabilities and shielding factors with a local linear response method *R Ahlberg and O Goscinski* 2254
Polarization effect in multiphoton ionization of hydrogen from metastable 2S state *B J Choudhury* 2268
Photoionization of the 2^1S and 2^3S states of helium *K L Bell, A E Kingston and I R Taylor* 2271
Semiphenomenological optical model for electron scattering on atoms *J B Furness and I E McCarthy* 2280
Three-body analysis of electron–hydrogen atom collisions *M Gryzinski, J Kunc and M Zgorzelski* 2292
Scattering of electrons by hydrogen and helium atoms using the eikonal approximation *B C Saha, K Sarkar and A S Ghosh* 2303
Energy and angular distributions of electrons ejected from autoionization states in neon by electron impact *S Tahira, F Nishimura and N Oda* 2306
The elastic scattering of positrons by helium in the close coupling approximation *C E Wardle* 2310
Variational continuum distorted wave approximation: Proton–hydrogen charge transfer at very high energies *R Shakeshaft* 2315
Double excitation of helium by electron impact *E S Gillespie* 2321
Excitation of semi-forbidden $2s^2p^2\ ^3P–2s2p^3\ ^5S^0$ and $2s^2p\ ^2P^o–2s2p^2\ ^4P$ lines observed in quasars *A R G Jackson* 2325
Close coupling calculations for massive ion–hydrogen atom collisions in the linear trajectory model *A Msezane and D F Gallaher* 2334
Rotational excitation cross sections for e^-–N_2 scattering *N Chandra and P G Burke* 2355
Theory of the (e, 2e) reaction on molecules *I E McCarthy* 2358
Model potential calculations on open-shell molecules *C Bottcher* 2368
Semiempirical methods in molecules *K S Kulkarni and C R Sarma* 2377
Bloch–Siegert shift in optically oriented ^{199}Hg vapour *E Arimondo and G Moruzzi* 2382
Saturation effects in RF spectroscopy: IV. Transverse pumping and Haroche's resonances *S Stenholm and C G Aminoff* 2390
Collisions between electrons and H_2 ions: IV. Measurements of cross sections for dissociative ionization *B Peart and K T Dolder* 2409
A measurement of cross sections for the 1S–2S excitation of He^+ ions by electron impact *K T Dolder and B Peart* 2415
Resonant rotational excitation of H_2 by electron impact *G Joyez, J Comer and F H Read* 2427
Incoherent scattering of γ rays in C, Al, Cu, Sn and Pb *S Gopal and B Sanjeevaiah* 2441
Recoil effects in C–K x ray production by 60–250 keV copper ion bombardment of graphite *A D Marwick* 2445
Charge state dependence of x ray and Auger-electron emission spectra for rare-gas atoms: III. Krypton atom M-shell *F P Larkins* 2450
New diagram lines in the β-region of the L spectrum of holmium 67 *A N Nigam and Q S Kapoor* 2464
Scandium Kα and Kβ diagram, satellite and hypersatellite x rays *B Hodge, R Kauffman, C F Moore and P Richard* 2468
Rotational analysis of the (0,0) band of the orange-red system of $^{63}Cu^{16}O$ *A Antić-Jovanović and D S Pešić* 2473
The emission spectra of the AuSi, AuGe, AuSu and AuPb radicals *R Houdart and J Schamps* 2478

NO 12 DECEMBER 1973

LETTERS TO THE EDITOR

Spin precession and dynamics of coupled spins *G W Parker* L349
Glauber-eikonal approximation for multi-centre atomic collisions *J C Y Chen* L351
Misalignment resonance widths *D T Pegg* L356
Measurement of cross sections for the dissociative recombination of D_3^+ ions *B Peart and K T Dolder* L359

Equilibrium charge-fractions for H^+ and H_2^+ ions transmitted through carbon foils at 60–300 keV
B T Meggitt, K G Harrison and M W Lucas L362
Electron impact excitation and assignment of the low-lying electronic states of N_2O
R I Hall, A Chutjian and S Trajmar L365
A high resolution study of Ar LMM Auger electrons produced by ion bombardment
B M Johnson, D L Matthews, L E Smith and C F Moore L369
Rotational analysis of the $c^2\Delta_{3/2}$–$x^2\Pi_{3/2}$ and $G^2\Delta_{3/2}$–$x^2\Pi_{3/2}$ systems of the SnF molecule
R S Ram, K N Upadhya and D K Rai L372
On the double ionization of helium-like atoms by high-energy electron impact
F W Byron Jr, C J Joachain and M J van der Wiel L375
Double ionization—a reply to the comments of Byron, Joachain and van der Wiel *R J Tweed* L378
Coulomb effects on electron negative ion detachment *T L John and B Williams* L381
The free–free transitions of neon and argon negative ions *T L John and A R Williams* L384

PAPERS

Classical statistical equilibrium constants and distribution functions *D R Bates and C S McKibbin* 2485
Virial theorem for elastic scattering of electrons and positrons by helium
J D G McWhirter and B L Moiseiwitsch 2489
Energies and Z-expansion coefficients for the D states in the helium sequence
P Blanchard and G W F Drake 2495
S-wave positron scattering by hydrogen atoms *Y F Chan and P A Fraser* 2504
The influence of the Pauli exclusion principle on electron impact ionization of light atoms
E W Knapp 2516
Relativistic theory of electron scattering from hydrogenic systems *G D Carse and D W Walker* 2529
A calculation of exchange cross sections in helium *K C Mathur and M R H Rudge* 2545
The excitation of ^1P states in helium by proton impact *K C Mathur and M R H Rudge* 2555
The elastic small angle scattering of ions at atoms in the high energy region: II. Comparison with experimental results *H J Beier* 2564
Electron loss *D R Bates and W R McDonough* 2572
Influence of the effective charges on the five-fold differential cross section for ionization of hydrogen and helium *M Schulz* 2580
Electron detachment for 50 keV He^- ions leading to metastable and ground state atoms
E Horsdal Pedersen and P Hvelplund 2600
Saturation effects of transverse resonances in optical pumping experiments
N Tsukada, Y Murakami and T Ogawa 2605
Formation of muonium in fast collisions of μ^+ mesons with atomic systems
Dž S Belkić and R K Janev 2613
Singlet–triplet differences in the lowest Π_u states of H_2 *E A Colbourn* 2618
Collisional detachment of electrons and ion molecule reactions in oxygen
B C O'Neill and J D Craggs 2625
Collisional detachment of electrons in sulphur hexafluoride *B C O'Neill and J D Craggs* 2634
Ionization and fragmentation of diatomic molecular gases by 5–45 keV Ne^+ and Na^+ ions and Ne atoms *W G Graham, C J Latimer, R Browning and H B Gilbody* 2641
A new ultraviolet band system of the SrI molecule *Ashrafunnisa, D V K Rao and R T Rao* 2653
The spectrum of SiO^+ and SiN *M Singh, H Bredohl, Fr Remy and J Dubois* 2656
Double ionization of the helium atom involving absorption of many-photons of intense laser beam
M Mohan and R K Thareja 2660
The intensities of the resonance lines of highly ionized hydrogen-like ions
R J Hutcheon and R W P McWhirter 2668
Measurement and interpretation of plasma polarization shift for members of the resonance series of ionized helium *A H Gabriel and S Volonte* 2684
Some observations on the decay of the Lewis–Rayleigh afterglow in a nitrogen–oxygen mixture
M Outred and M E Pillow 2701

Subject index, Vol 6 2707

Author index (with titles), Vol 6 2720

Subject Index

The 1973 Subject Index is based upon the new Physics Abstracts Classification scheme instead of the key word scheme of previous years; articles are listed, as appropriate, under one or more of the following headings:

1.100 MATHEMATICAL METHODS
1.400 QUANTUM MECHANICS
2.600 QUANTUM OPTICS
2.610 Masers
2.630 Lasers
2.632 *Gas lasers*
2.650 Laser beam interactions and properties
2.680 Laser beam applications

3.000 ELEMENTARY PARTICLE PHYSICS
3.130 Symmetry and conservation laws
3.100 GENERAL

5.000 ATOMIC AND MOLECULAR PHYSICS
5.200 ATOMS
5.210 Atomic masses, mass spectra, abundances, isotopes
5.230 Atomic structure and spectroscopy
5.231 *Orbitals: self-consistent field and other methods*
5.232 *Electron correlations, configuration interactions*
5.234 *Relativistic corrections*
5.235 *Optical spectroscopy*
5.236 *X ray spectroscopy*
5.238 *Electric and magnetic moment, polarizability*
5.250 Fluorescence, resonances, excitations and energy transfer
5.270 Ionization continuum spectra, electron affinity
5.280 Collision processes and atomic interactions
5.282 *Electron scattering, excitation, ionization*
5.284 *Ion scattering and charge transfer*
5.286 *Atomic beams*
5.288 *Forces between atoms, interatomic potentials*
5.290 Mesic and muonic atoms, atoms containing other particles than normal
5.400 MOLECULES
5.410 Molecular configurations and dimensions
5.420 Molecular structure
5.422 *Orbitals: LCAO, SCF and variational methods*
5.424 *Electron correlations*
5.426 *Electronic structure*
5.428 *Vibrations, rotation, force constants*
5.440 Molecular spectroscopy
5.441 *Bonds, moments, polarizability*
5.442 *Visible and ultraviolet spectra*
5.443 *Vacuum ultraviolet spectra*
5.444 *Infrared and Raman spectra*
5.445 *Radiofrequency and microwave spectra*
5.446 *Line widths and profiles*
5.447 *Fluorescence, radiationless transitions*
5.448 *Level crossing, optical pumping*
5.449 *Isotope effects*
5.450 Magnetic resonance and relaxation
5.460 Ionization and dissociation, recombination
5.480 Collision processes and molecular interactions
5.482 *Electron scattering, excitation, ionization*
5.484 *Energy and spin transfer collisions*
5.486 *Molecular beams*
5.488 *Intermolecular forces*

6.000 GASES, FLUID DYNAMICS AND PLASMAS
6.100 PHYSICS OF BASES
6.110 Mechanical properties
6.140 Viscosity, diffusion
6.500 PLASMA PHYSICS
6.515 Transport, collision and interaction processes in plasma
6.530 Plasma flow, magnetohydrodynamics
6.500 PLASMA PRODUCTION AND HEATING
6.700 ELECTRIC DISCHARGES
7.160 Radiation damage and other radiation effects
8.600 MAGNETIC RESONANCE AND RELAXATION, MOSSBAUER EFFECT
9.500 ASTRONOMY AND ASTROPHYSICS
9.544 *Quasars*

1.100 MATHEMATICAL MODELS

Use of the Rayleigh–Ritz–Galerkin method with cubic splines for constructing single-particle bound-state radial wavefunctions: The hydrogen atom and its spectrum *B W Shore* B1923

1.400 QUANTUM MECHANICS

A comment on 'The multipole hamiltonian for time dependent fields *R G Woolley* BL97

Relation d'incertitude et theorie des perturbations *B Tsapline* BL131

Operator expectation values in $1/Z$ perturbation theory *J Killingbeck* BL142

Regular and irregular spectra *I C Percival* BL229

Transition moment integrals and the hypervirial theorem: II *J C Nash* B393

Translational factors in eikonal approximation and their effect on channel couplings *J C Y Chen, V H Ponce and K M Watson* B965

A modified correspondence principle for strongly coupled states *A P Clark* B1153

The relativistic theory of the angular distribution of photoelectrons in *jj* coupling *T E H Walker and J T Waber* B1165

A simple perturbation-variational calculation for $1s^1\,{}^1S$ *J Killingbeck* B1376

Perturbed symmetric resonance: an exact formula *D S F Crothers* B1418

A note on the equivalence of the classical motion of rigid bodies with prescribed angular velocities and the quantum mechanical solutions for paramagnetic atoms in external fields *F Ansbacher* B1617

A unitary perturbation method for a paramagnetic atom in a magnetic field with constant and oscillatory components *F Ansbacher* B1621

An improved coordinate transformation for the treatment of a paramagnetic atom in a linear oscillatory and a constant transverse magnetic field *F Ansbacher* B1634

On the relative accuracies of eigenvalue bounds *C A Coulson and P J Haskins* B1741

2.600 QUANTUM OPTICS

Influence of photon statistics on the Bloch–Siegert shift *L Armstrong jr and S Feneuille* BL182

Power series expansion for the RF resonance shift *S Stenholm* BL240

A quantum calculation of the higher order terms in the Bloch–Siegert shift *C Cohen-Tannoudji, J Dupont-Roc and C Fabre* BL214

An experimental check of higher order terms in the radiative shift of a coherence resonance *C Cohen-Tannoudji, J Dupont-Roc and C Fabre* BL218

Analytical expressions for the Bloch–Siegert shift *P Hannaford, D T Pegg and G W Series* BL222

Saturation effects in RF spectroscopy: III. Mixing of nearly degenerate levels by strong off-resonant fields *S Stenholm* B1097

Polarization phenomena in multiphoton ionization of atoms *V L Jacobs* B1461

Saturation effect in RF spectroscopy for transverse optical pumping *N Tsukada and T Ogawa* B1643

Quantum theory of RF resonances: The semiclassical limit *S Stenholm* B1650

Bloch–Siegert shift in optically oriented ^{199}Hg vapour *E Arimondo and G Moruzzi* B2382

Saturation effects in RF spectroscopy: IV. Transverse pumping and Haroche's resonances *S Stenholm and C G Aminoff* B2390

Saturation effects of transverse resonances in optical pumping experiments *N Tsukada, Y Murakami and T Ogawa* B2600

2.610 Masers

Nuclear spin analogue of a molecular beam maser with cavities in series *W H U Krause and D C Laine* B1510

2.630 Lasers

2.632 Gas lasers

Continuous wave laser oscillation in singly ionized arsenic *J A Piper and C E Webb* BL116

Metastable densities and excitation processes in the He–Cd laser discharge *P G Browne and M H Dunn* B1103

Collisional excitation and destruction of excited Zn II levels in a helium afterglow *J M Green, G J Collins and C E Webb* B1545

New high-gain transitions in neon *J H Sanders and J E Thomson* B2177

2.650 Laser beam interactions and properties

Electron temperature and ionization state in laser produced plasmas *T P Donaldson, R J Hutcheon and M H Key* B1525

Stark broadening of high quantum number $n = 1$ transitions of carbon V and VI in a laser produced plasma *F E Irons* B1562

2.680 Laser beam applications

Excited state absorption spectroscopy of alkaline earths selectively pumped by tunable dye lasers: I. Barium arc spectra *D J Bradley, P Ewart, J V Nicholas and R D Shaw* B1595

3.000 ELEMENTARY PARTICLE PHYSICS

3.100 GENERAL

3.130 Symmetry and conservation laws

The hydrogen atom as a relativistic elementary particle: I. The wave equation and mass formulae *A O Barut and W Rasmussen* B1695

The hydrogen atom as a relativistic elementary particle: II. Relativistic scattering problems and photo-effect *A O Barut and W Rasmussen* B1713

3.300 QUANTUM ELECTRODYNAMICS AND ELECTROMAGNETIC INTERACTIONS

3.310 Specific calculations and limits of QED

The hydrogen atom as a relativistic elementary particle: I. The wave equation and mass formulae *A O Barut and W Rasmussen* B1965

The hydrogen atom as a relativistic elementary particle: II. Relativistic scattering problems and photo-effect *A O Barut and W Rasmussen* B1713

5.000 ATOMIC AND MOLECULAR PHYSICS

5.200 ATOMS

5.230 Atomic structure and spectroscopy

Single excitations in multiconfiguration wavefunctions: Ground states of the atoms Be to F *F Grein and T C Chang* BL37

A unified calculation on the Stark broadened profile of Lyman-alpha *C Bottcher* BL54

A quantum calculation of the higher order terms in the Bloch–Siegert shift *C Cohen-Tannoudji, J Dupont-Roc and C Fabre* BL214

An experimental check of higher order terms in the radiative shift of a coherence resonance *C Cohen-Tannoudji, J Dupont-Roc and C Fabre* BL218

Analytical expressions for the Bloch–Siegert shift *P Hannaford, D T Pegg and G W Series* BL222

Power series expansion for the RF resonance shift *S Stenholm* BL240

Multichannel effects on the free–free transitions of Li^- at the infra-red threshold *T L John, D J Morgan and A R Williams* BL255

Absolute line strengths by analysis of Lu–Fano plots with application to excited state transitions in neon *A F Starace* B76

A truncation technique for the real time two-particle Green function hierarchy *R W Lee* B406

The ionization potential and the $4s4p^6$ *nl* levels of ^{86}Kr I *M S Z Chaghal and V Hassan* B433

Quasi-Landau spectrum of a hydrogenlike atom in a high magnetic field *A F Starace* B585

On a geometrical realization of the Aufbau scheme *M Berrondo and O A Novarro* B761

Excited state wavefunctions for helium *R J Tweed* B770

Calculation of the dynamic dipole polarizabilities and Van der Waals coefficients of beryllium and carbon atoms in the ground state *W D Robb* B945

A theoretical study of the effects of ion motion on spectral lines in plasmas: I. Neutral helium lines *R W Lee* B1044

A theoretical study of the effects of ion motion on spectral lines in plasmas: II. Hydrogen–H_β *R W Lee* B1060

Saturation effects in RF spectroscopy: III. Mixing of nearly degenerate levels by strong off-resonant fields *S Stenholm* B1097

Calculation of relative oscillator strengths of spectral lines from atomic self-absorption data *A S Farghaly* B1288

LS-term dependence of Slater integrals in $p^n p'$ configurations: I. Hartree–Fock calculations for individual terms of the $np^5n'p$ configurations in the Ne I and Ar I isoelectronic sequences *J E Hansen* B1387

Studies of the quadratic Zeeman effect: I. Application of the sturmian functions *A R Edmonds* B1604

Saturation effect in RF spectroscopy for transverse optical pumping *N Tsukada and T Ogawa* B1643

Quantum theory of RF resonances: The semiclassical limit *S Stenholm* B1650

The hydrogen atom as a relativistic elementary particle: I. The wave equation and mass formulae *A O Barut and W Rasmussen* B1695

The hydrogen atom as a relativistic elementary particle: II. Relativistic scattering problems and photo-effect *A O Barut and W Rasmussen* B1713

LS-term dependence of Slater integrals in $p^n p'$ configurations: II. Deviations from the single-configuration approximation in the $np^5n'p$ configurations *J E Hansen* B1751

Parametric study of isotope shifts in Ne I *J C Keller* B1771

Measurement in the non-linear Stark effect in hydrogenlike He$^+$, $n = 4$ *H J Beyer, H Kleinpoppen and J M Woolsey* B1849
Use of the Rayleigh–Ritz–Galerkin method with cubic splines for constructing single-particle bound-state radial wavefunctions: The hydrogen atom and its spectrum *B W Shore* B1923
Nuclear charge expansion method for $1snl\,^{1,3}L$–$1sn'l'\,^{1,3}L$ transitions in the helium isoelectronic sequence *C Laughlin* B1942
Transition probabilities in the lithium isoelectronic sequence *C Laughlin, M N Lewis and Z J Horaks* B1953
LS-term dependence of Slater integrals in $p^n p$ configurations: III. Deviations from the single-configuration approximation in the $2p^4 3p$ configurations *J E Hansen* B1967
Many-body calculations for the heavy atoms: III. Pair correlations *J C Morrison* B2205
The accurate numerical determination of two and three-body dispersion forces *R F Stewart* B2213
Relativistic Hartree–Fock calculations of some properties of rare earth atoms and ions *M A Coulthard* B2224
Atomic polarizabilities and sheilding factors with a local linear response method *R Ahlberg and O Goscinski* B2254
Bloch–Siegert shift in optically oriented ^{199}Hg vapour *E Atimondo and G Moruzzi* B2382
Saturation effects in RF spectroscopy: IV. Transverse pumping and Haroche's resonances *S Stenholm and C G Aminoff* B2390
Energies and Z-expansion coefficients for the D states in the helium sequence *P Blanchard and G W F Drake* B2495
Saturation effects of transverse resonance in optical pumping experiments *N Tsukada, Y Murakami and T Ogawa* B2605
Measurement and interpretation of plasma polarization shift for members of the resonance series of ionized helium *A H Gabriel and S Volonte* B2684

5.231 Orbitals: self consistent field and other methods

The spin density of the m^2S states in the lithium isoelectronic sequence *A L Stewart* BL51–3
On the validity of momentum translation approximation *B J Choudhury* BL100
Low intensity and high intensity limits of the momentum translation approximation *B J Choudhury* BL103
Oscillator strengths in the beryllium sequence *A Hibbert* BL127
Relationship between the Coulomb and hydrogenic approximation for $\langle r^k \rangle$ *A Szabo and S A Adelman* BL193
Stark effect in the Li hyperfine structure *U Kaldor* B71
Simple analytical wavefunctions for the ions of the irongroup *J Kollar and G Solt* B329
Variational calculations of correlated wavefunctions and energies for ground, low-lying as well as highly excited discrete states in many-electron atoms using a new atomic structure theory including electron correlation *C A Nicolaides and D R Beck* B535
On second-order magnetic hyperfine interactions in one-electron atoms: connections between the Schrödinger, Dirac and quantum electrodynamical perturbation calculations *E Latvamaa, L Kuritsu, P Prykko and L Tataru* B591–600
A derivation of general open-shell SCF equations for atoms and molecules with a Green function method *R Albat and N Gruen* B601–13
Coulomb hole in some excited states of helium *R J Boyd and C A Coulson* B782–93
An experimental determination of the Rydberg constant *B P Kibble, W R C Rowley, R E Shawyer and G W Series* B1079
The Stark effect in hydrogen and precision measurements of the Rydberg constant *J A Blackman and G W Series* B1090
The rate convergence of the Fredholm method *M B Hidalgo, J Nuttall and R W Stagat* B1364–70
The first-order Hartree–Fock equations for the $nsns\,^1$S states of helium-like ions *I Rebelo* B1382–6
Virtual orbits, excitation energies, and oscillator strengths *N Bjorna* B1412
Feshbach-type $^3P^e$ autoionizing states of H^- *E Holoien and J Midthal* B1992

5.232 Electron correlations, configuration interaction

Theoretical oscillator strengths for the beryllium $1s^2 2s^2$ $1S$–$1s^2 2s2p\,{}^1P^o$, $1s^2 2s2p\,{}^1P^o$–$1s^2 2p^2\,{}^1D$ and $1s^2 2s2p\,{}^1P^o$–$1s^2 2p^2\,{}^1S$ isoelectronic sequences *C A Nicolaides, D R Beck and O Sinanoglu* B62
The importance of electronic correlations for the calculation of x ray and fast electron scattering by Be, B, C, N, O, F: (II) *M Naon and M Cornille* B1347
A simple perturbation-variational calculation for $1s^2\,{}^1S$ *J Killingbeck* B1376
Correlation effects on specific isotope shifts *J J Labarthe* B1761
Brillouin's theorem for excited $(nl)^N(n'l')^1$ configurations *C F Fischer* B1933
Some S state energies for He and Li^+ using a simple correlated trial function *P J Haskins* B2220

5.234 Relativistic corrections
A perturbation analysis of current methods of calculating relativistic energies *A M Ermolaev and M Jones* B1
Relativistic contributions to screening ratios in europium *M A Coulthard* B23
5.235 Optical spectroscopy
Isotope shift of ^{20}Ne, ^{21}Ne and ^{22}Ne and hyperfine structure ^{21}Ne in the lines 6096 Å and 6074 Å of neon I *R J Champeau and J C Keller* BL76
Observations of stimulated anti-Stokes radiation in barium vapour *J L Carlsten and T J McIlrath* BL80
The emission spectrum of yttrium VI *M S Z Chaqtai, Z Ali and S Khatoon* B232
Experimental and theoretical studies on non-adiabatic ion dynamic contributions to the He I 4026 2^3P–5^3D, 5^3F profile at low electron densities *R Mahon, R W Lee and D D Burgess* B354
Terms of N VI and O VII *S C Baker* B709
Measurements of excitation rate coefficients for some Ne VIII lines *G N Haddad and R P McWhirter* B715
Excited state absorption spectroscopy of alkaline earths selectively pumped by tunable dye lasers: I. Barium arc spectra *D J Bradley, P Ewart, J V Nicholas and J R D Shaw* B1595
Measurements of the broadening and shift of the Na-D lines by helium at low pressure *J P Deleage, D Kunth, G. Testor, F Rostas and E Roueff* B1892
Re-examination of the spectrum of strontium: autoionization in the spectrum of neutral strontium *G H Newsom, S O'Connor and and R C M Learner* B2162
5.236 X ray spectroscopy
Observation of chlorine K_α satellite and K_β satellite transitions *C Fred Moore and H Wolter* L124
High resolution $L_{2,3}M_{2,3}M_{2,3}$ Auger electron spectra of argon *T Kondow, T Kawai, K Kunimori, T Onishi and K Tamaru* L156
The production of characteristic x rays by proton bombardment and the ratio of characteristic to continuous radiation B562
Coster–Kronig and fluorescence yields for the L_2 and L_3 subshells in the high-Z region *J C McGeorge, D W Nix and R W Fink* B573
An experimental determination of the Rydberg constant *B P Kibble, W R C Rowley, R E Shawyer and G W Series* B1079
Lyman x rays from a highly stripped nitrogen beam *C Fred Moore, W J Braithwaite and D L Matthews* B1592
Calculations of lifetimes for states of Ti II *Per Kaijser and J Lindbergh* B1975
The $M_{4,5}$ spectrum of ^{58}Ce and the γ-α phase transition *D Ottewell, E A Stewardson and J E Wilson* B2184
X ray decay energies of highly ionized fluorine atoms *R L Kauffman, C W Woods, F F Hopkins, D O Elliott, K A Jamison and P Richard* B2204
Incoherent scattering of γ rays in C, Al, Cu, Sn and Pb *S Gopal and B Sanjeevaiah* B2441
Recoil effects in C–K x ray production by 60–250 keV copper ion bombardment graphite *A D Marwick* B2445
New diagram lines in the β-region of the L spectrum of holmium 67 *A N Nigam and Q S Kapoor* B2465
Charge state dependence of x ray and auger-electron emission spectra for rare-gas atoms: III. Krypton atom M-shell *F P Larkins* B2450
Scandium K_α and K_β diagram, satellite and hypersatellite x rays *B Hodge, R Kauffman, C Fred Moore and P Richard* B2469
5.238 Electric and magnetic moment, polarizability
A note on the equivalence of the classical motion of rigid bodies with prescribed angular velocities and the quantum mechanical solutions for paramagnetic atoms in external fields *F Ansbacher* B1617
A unitary perturbation method for a paramagnetic atom in a magnetic field with constant and oscillatory components *F Ansbacher* B1621
An improved coordinate transformation for treatment of a paramagnetic atom in a linear oscillatory and a constant transverse magnetic field *F Ansbacher* B1634
5.250 Fluorescence, resonances, excitations and energy transfer
Photoionization resonance profile parameters of the $3s3p\,^1P_1$ two-electron excitation in He I *P Dhez and D L Ederer* BL59
On particular aspects of the competition between stimulated emission and absorption in the 3.36 μm xenon line profile *J Brochard, D Reymann and R Vetter* BL145
Collective effects in atomic photoabsorption spectra: III. Collective resonance in the $4d^{10}$ shell in Xe *G Wendin* B42
Misalignment effects in magnetic resonance *D T Pegg* B241
Semi-classical model of magnetic resonance in intense RF fields *D T Pegg* B246
Multipole relaxation and transfer rates in the impact approximation: application to the resonance interaction *C G Carrington, D N Stacey and J Cooper* B417

The starke effect in hydrogen and precision measurements of the Rydberg constant *J A Blackman and G W Series* B1090
Spin–orbit coupling and the interaction of molecules with the radiation field *L D Barron and A D Buckingham* B1295
Quantum defect theory : X. Photoionization *J Dubau and J Wells* B1425
Collisional excitation and destruction of excited Zn II levels in a helium afterglow *J M Green, G J Collins and C E Webb* B1545
Krypton M-shell auger and Coster–Kronig electron energies *F P Larkins* B1556
Some observations on the decay of the Lewis–Rayleigh afterglow in a nitrogen–oxygen mixture *M Outred and M E Pillow* B2701
Double ionization of the helium atom involving absorption of many-photons of intense laser beam *M Mohan and R J Tharejo* B2660

5.270 Ionization, continuum spectra, electron affinity

Temperature determination from the relative line-to-continuum intensity of the He II 4686 and 3203 lines *A Delcroix and S Volonte* BL4
A comment on the momentum translation approximation for the calculation of transition amplitude for high-order electromagnetic transitions *B J Choudhury* BL37
Multiple absorption of laser photons by atoms *F H M Faisal* BL89
Circular versus linear polarization in multiphoton ionization of hydrogen *R N DeWitt* BL93
The capture amplitude for the ionization of He by electron impact *D H Phillips and M R C McDowell* BL165
Revised absolute absorption cross section of Ba I at 237.9 nm *J L Carlsten and T J McIlraith* BL284
Two-photon ionization of trivalent atoms as a source of polarized electrons *P S Farago and D W Walker* BL280
Autoionization states in the photoionization of neon *T M Luke* B30
Two-photon ionization of Li, Na and K with polarized photons *J Mizuno* B314
The second Born approximation *R J Tweed* B398
Multiphoton transitions : IV. Bound–free transition integrals in compact forms *F H M Faisal* B553
Bound–free transitions in electromagnetic field of arbitrary intensity *N K Rahman and F H M Faisal* B559
The photoionization cross section of magnesium near threshold *G N Bates and P Altick* B653
Production of large numbers of atoms in a selected excited state by laser optical pumping : calcium *T J McIlraith and J L Carlsten* B697
Application of the momentum translation method to multiphoton ionization of hydrogen by intense electromagnetic fields *R N DeWitt* B803
Measurements of the thermal diffusion coefficient for electrons in helium *D K Gibson, R W Crompton and G Cavalleri* B1118
The relativistic theory of the angular distribution of photoelectrons in *jj* coupling *T E H Walker and J T Waber* B1165
Ionization processes in He–He collisions *M Barat, D Dhuicq, R Francois, C Lesech and R McCarroll* B1205
Simultaneous multiphoton ionization and excitation of helium in an intense laser beam *M Mohan* B1218
Photoionization of the 1^1S state of helium *K L Bell, A E Kingston and I R Taylor* B1228
Polarization phenomena in multiphoton ionization of atoms *V L Jacobs* B1461
Measurements which indicate the existence of a second short-lived state of H^{2-} *B Peart and K T Dolder* B1497
Calculations of state functions behind ionizing shockwaves in potassium and caesium vapour *R M Hill and E M Jones* B1685
The effect of the electron bound state structure on ionization cross sections in atomic collisions *V S Nikolaev, V S Senashenko and V Yu Shafer* B1779
Secondary electron emission by metastable particle impact in ionization growth experiments *S C Haydon and O M Williams* B1856
Secondary ionization by metastable particles in nitrogen *S C Haydon and O M Williams* B1866
Two-photon detachment cross section of H^- *S A Adelman* B1986
Polarization effect in multiphoton ionization of hydrogen from metastable 2s state *B J Choudhury* B2268
Photoionization of the 2^1S and 2^3S states of helium *K L Bell, A E Kingston and I R Taylor* B2271
The intensities of the resonance lines of highly ionized hydrogen-like ions *R J Hutcheon and R W P McWhirter* B2668

5.280 Collision processes and atomic interaction

The binary diffusion coefficient of moderately dense gas mixtures *W A Wakeham* B372

Time-reversal in the impact parameter method *R Shakeshaft, J Macek and E Gerjouy* B794
Excitation of highly excited hydrogenic ions and atoms by charge particles: IV. *D Richards* B823
Mobility, diffusion and interaction potential for potassium ions in argon *H R Skullerud* B918
Equivalence of wave and impact parameter Born expansions *R Shakeshaft* B1357
Potential scattering cross sections in the semiclassical limit *K E Mount* B1397
Detailed balance as a check on impact parameter calculations *Hsiang Tai and E Gerjuoy* B1426
Krypton M-shell auger and Coster–Kronig electron energies *F P Larkins* B1556
The hydrogen atom as a relativistic elementary particle: I. The wave equation and mass formulae *A O Barut and W Rasmussen* B1695
The hydrogen atom as a relativistic elementary particle: II. Relativistic scattering problems and photo-effect *A O Barut and W Rasmussen* B1713
Variational methods in potential scattering *M R H Rudge* B1788
Evaluation of exchange matrix elements in p–H collision *Hsiang Tai* B1797
Differential cross sections for alkali–halogen collisions from trajectory calculations on intersecting surfaces *R Duren* B1801
Electron detachment from alkali–metal negative ions by electron collisions *T L John and R Williams* B1814
Transitions among the $3p\,^2P$ states of sodium induced by collisions with helium *R G H Reid* B2018
Calculation of exchange cross sections in helium *K C Mathur and M R H Rudge* B2545

5.282 Electron scattering, excitation, ionization

The least squares method applied to scattering problems *F H Read and J R Soto-Monteil* BL15
Calculated photoionization cross sections for Be and Mg *J Dubau and J Wells* BL31
Coulomb effects in the final state of an ionizing collision between electrons and helium atoms *A Salin* BL34
The optical model for 100 eV elastic electron scattering on argon *J B Furness and I E McCarthy* BL42
Autoionizing transitions in N_2 and H_2 produced by electron impact *P J Hicks, J Comer and F H Read* BL65
The differential cross section for elastic scattering of electrons from atomic hydrogen *P J O Teubner, C R Lloyd and E Weigold* BL134
Autoionizing states in argon *J W McConkey and J A Preston* B2138
The capture amplitude for the ionization of He by electron impact *D H Phillips and M R C McDowell* BL165
Difficulties with the Faddeev–Watson multiple scattering expansion in atomic physics *F W Byron jr and C J Joachain* BL169
On the anomaly in the cross sections for electron loss and capture by multiply charged ions in neons *Yu S Volodyagin, I S Dmitriev, V S Nikolaev, Yu A Tashaev and Ya A Teplova* BL171
The measurement of total cross sections for positrons of energies 2–400 eV in He, Ne, Ar, and Kr *K F Canter, P G Coleman, T C Griffith and G R Heyland* BL201
The (e, 2e) experiment as a probe for atomic structure *J B Furness and I E McCarthy* BL204
Resonances in low energy electron-mercury scattering *M Düweke, N Kirchner, E Reichert and E Staudt* BL208
Calculation of electron scattering by neutral oxygen, using an accurate representation for the target *H E Saraph* BL243
The use of second order potentials in the theory of scattering of charged particles by atoms: VI. Elastic scattering of electrons by hydrogen and helium atoms *K H Winters, C D Clark, B H Bransden and J P Coleman* BL247
Inelastic electron–helium scattering at large angles *P S Nicholls and K H Winters* BL250
Elastic and 2s,2p excitation cross sections of hydrogen atom by the Faddeev approach *B C Saha, A S Ghosh and N C Sil* BL252
Electron impact ionization of neon and argon *J Fletcher and I R Cowling* BL258
The differential cross section for elastic scattering of electrons by H_2 in the first Born approximation *J W Liu and V H Smith Jr* BL275
Classical cross sections for collisions between electrons and hydrogen atoms at intermediate energies *I C Percival* B93
Simplified model for the scattering of zero energy electrons by helium atoms *S K Houston* B131
Variational calculations of the positron–helium scattering length using approximate target wavefunctions *S K Houston* B136
Measurements of cross sections for the ionization of Ba^+ by energy resolved electrons *B Peart, J G Stevenson and K T Dolder* B146
A comparison of the second Born approximation using plane-wave and final-state Green functions *A R Holt and B Santoso* B254

Double ionization by electron impact: I. General theory *R J Tweed* B259
Double ionization by electron impact: II. Calculations of cross sections for H^-, He and Li^+ *R J Tweed* B270
Threshold behaviour of e–H collisional excitation function: classical treatment *P Grujic* B286
Elastic scattering of slow electrons by helium *M Knowles and M R C McDowell* B300
Electron scattering by atomic hydrogen using a pseudo-state expansion: IV. The convergence of the S-state expansion at intermediate energies *P G Burke and J F R Mitchell* B320
Inelastic collision of fast charged particles with arbitrary levelled hydrogen-like atoms *K Omidvar and A H Khateeb* B341
The use of second-order potentials in the theory of the scattering of charged particles by atoms: IV. Electron scattering of helium atoms *K A Berrington, B H Bransden and J P Coleman* B436
Collisions of fast electrons with helium: III. Excitation of the $(1s, nd)\ ^1D$ and $(ns, np)\ ^1P$ states *M J Woolings and M R C McDowell* B450
Mean energy loss per ion pair and stopping power of helium gas for electrons *B L Jhanwar and S P Khare* B462
Spin polarization by electron resonance scattering from neon *T Heindorff, J Hofft and E Reichert* B477
Asymptotic solutions of the coupled equations of electron–atom collision theory for the case of some channels closed *D W Norcross and M J Seaton* B614
Application of classical collision theory to electron impact double ionization of atoms *B N Roy and D K Rai* B816
Correlated radial momentum distributions $I(p)$ and Compton profiles $J(q)$: The (^1S) Be and (^1S) Ne atoms ground states *M Naon and M Cornille* B954
Electron scattering by Li, Na, and K in the frozen core Glauber approximation *H R J Walters* B1003
The role of many-electron correlation in fast electron–atom inelastic collisions *M Ya Amusia, N A Cherepkov, R K Janev, S I Sheftel and Dj Živanović* B1028
The calculation of resonances in electron–ion scattering using the distorted wave approximation *M D Hershkowitz and M J Seaton* B1176
The importance of electronic correlations for the calculations of x rays and fast electron scattering by Be, B, C, N, O, F: (II) *M Naon and M Cornille* B1347
Asymptotic expansion of the wavefunction for e–H scattering *M B Hidalgo, J Nuttall and R W Stagat* B1371
On the polarization of the resonance lines of lithium and sodium atoms by electron impact *A N Tripathi, K C Mathur and S K Joshi* B1431
Electron impact excitation of H and He^+: I. $1s \rightarrow ns$ transitions *M R C McDowell, L A Morgan and V P Myerscough* B1435
Variational methods in potential scattering *M R H Rudge* B1788
Electron detachment from alkali-metal negative ions by electron collisions *T L John and R Williams* B1814
Collision integrals of carbon–oxygen atoms in different electronic states *M Capitelli and E Ficocelli V.* B1819
Many-body theory of the generalized optical potential for electron–atom (molecule) inelastic scattering *Gy Csanak, H S Taylor and D N Tripathy* B2040
Adiabatic limit and nonadiabatic effects in the second order transition potential: Semi-empirical analysis *Gy Csanak and H S Taylor* B2055
Scattering of electrons by hydrogen and helium atoms using the eikonal approximation *B C Saha, K Sarkar and A S Ghosh* B2203
Semiphenomenological optical model for electron scattering on atoms *J B Furness and I E McCarthy* B2280
Three-body analysis of electron–hydrogen atom collisions *M Gryziński, J Kunc and M Zgorzelski* B2292
Energy and angular distribution of electrons ejected from autoionization states in neon by electron impact *S Tahira, F Nishimura and N Oda* B2306
Double excitation of helium by electron impact *E S Gillespie* B2321
Excitation of semi-forbidden $2s^22p^{33}P–2s2p^{35}S^o$ and $2s^22p\ ^2P^o–2s2p^2\ ^4P$ lines observed in quasars *A R G Jackson* B2325
Influence of the effective charges on the five-fold differential cross section for ionization of hydrogen and helium *M Schulz* B2580
The influence of the Pauli exclusion principle on electron impact ionization of light atoms *E W Knapp* B2516
Electron detachment for 50-keV He^- ions leading to metastable and ground-state atoms *E Horsdal Pedersen and P Hvelplund* B2600
Relativistic theory of electron scattering from hydrogenic systems *G D Carse and D W Walker* B2529
Electron impact ionization of argon measurements of triple differential cross

sections *H Ehrhardt, K H Hesselbacher, K Jung, E Schubert and K Willmann* B Dec

5.284 Ion scattering and charge transfer

Detachment cross sections for He^- ions *R Snyder* BL8

Charge exchange in Li^+–He collisions *C Lesech, R McCarroll and J Baudon* BL11

Dependence of symmetrical charge transfer cross section on ionization potential *D P Dewangan* BL20

Effect of u–g symmetry on direct and exchange excitations in ion–atom scattering *M Barat, J C Brenot and J Pommier* BL105

Ar^+–Ar momentum transfer cross sections in the range 4–7 eV *J J B Frommelt and I R Jones* BL178

Translational energy spectrum of O_2^+ ions formed by 4 keV O_2^+ ions impacting on argon *F C Fehsenfeld, J Appell, P Fournier and J Durup* BL268

Sur la dissociation des ions CH_nD_{4-n} $(n \leqslant 4)$ au cours de collisions avec des atomes de gaz rares *E Constantin and J Ch Abbe* BL272

Charge transfer into excited states in thermal energy collision *A R Turner-Smith, J M Green and C E Webb* B114

Electron capture and excitation in He^{++}–He collisions *S C Mukherjee, K Roy and N C Sil* B467

Inelastic scattering of electrons and protons by atoms at intermediate energies *C J Joachain and R Vanderpoorten* B622

Classical treatment of fast atomic collisions *D R Bates and R Snyder* B642

Differential scattering cross section for excitation in He^+–Ne collisions *C Gaussorgues* B675

The elastic small angle scattering of ions at atoms in the high energy region: I. Theoretical results *H J Beier* B683

The use of second order potentials in the theory of scattering of charged particles by atoms: V. Excitation of atoms by fast protons and charge exchange *S Begum, B H Bransden and J Coleman* B837

Vacancy occupation probabilities in ion–atom collisions *J H Macek and J S Briggs* B841

A scaling law for inner-shell excitation cross sections in ion–atom collisions *J S Briggs and J H Macek* B982

Electron detachment from negative ions by charged particle collision: I. Proton impact *R Gayet, R K Janev and A Salin* B993

Electron capture from hydrogen and helium atoms by fast alpha particles *Dz S Belkic and R K Janev* B1020

Comparison of binary-encounter and Born approximation for incident neutral systems *J H Harberger, R E Johnson and J W Boring* B1040

Ionization processes in He–He collisions *M Barat, D Dhuicq, R Francois, C Lesech and R McCarroll* B1206

A theoretical study of proton–helium scattering *D Baye and P H Heenen* B1255

Electron-loss cross sections of lithium atoms in gases *E Horsdal Pedersen and P Hvelplund* B1277

Perturbed symmetric resonance: an exact formula *D S F Crothers* B1418

Ion spectra from slow collisions of He^+ with He, Ne, Ar, and of Ne^+ with Ne *G Gerber, A Niehaus and S Steffan* B1830

Variational continuum distorted wave approximation: Proton–hydrogen charge transfer at very high energies *R Shakeshaft* B2315

Close coupling calculations for massive ion–hydrogen atom collisions in the linear trajectory model *A Msezane and D F Gallaher* B2334

Charge state dependence of x ray and auger-electron emission spectra for rare-gas atoms *F P Larkin* B2450

The elastic small angle scattering of ions at atoms in the high energy region: II. Comparison with experimental results *H J Beier* B2564

5.286 Atomic beams

Effect of nuclear symmetry in ^{4}He on He and ^{3}He on ^{3}He collisions at moderate energies *D Dhicq, J Baudon and M Barat* BL1

Chemiionization in collisions of $He(2^3S)$ and He (2^1S) metastable atoms with H and H_2 *J S Howard, J P Riola, R D Rundel and R F Stebbings* BL109

Calculation of cross sections for chemiionization of H by $He(2^1S)$ and $He(2^1S)$ metastable atoms *J S Cohen and N F Lane* BL113

A theoretical study of fast proton–atomic hydrogen scattering *D Baye and P H Heenen* B105

Excitation of helium by 20/–100 keV hydrogen atoms *W G F Blair and H B Gilbody* B483

Ionization processes in slow collisions of heavy particles: II. Symmetrical systems of the rare gases He, Ne, Ar, Kr *G Gerber, R Morgenstern and A Niehaus* B493

Ionization processes in He–He collisions *M Barat, D Dhuicq, R Francois, C Lesech and R McCarroll* B1206

Destruction of fast metastable hydrogen atoms passing through atomic helium *K L Bell, A E Kingston and W A McIlveen* B1237

Formation of H(2s) and H(2p) in collisions of atomic hydrogen with atomic helium *K L Bell, A E Kingston and W A McIlveen* B1246

Excitation of helium in He^+–He and He–He collisions: the influence of metastable helium atoms *W G F Blair, R W McCullough, F R Simpson and H B Gilbody* B1265
Evaluation of exchange matrix elements in p–H collisions *Hsiang Tai* B1797
Differential cross sections for alkali–halogen collisions from trajectory calculations on intersecting surfaces B1801
Collision integrals of carbon–oxygen atoms in different electronic states *M Capitelli and E Ficocelli V* B1819
Rotational inelasticity in polar diatom–atom scattering: application of the semi-classical time-dependent perturbation theory to the Ne–CO and Ne–HCl systems *S Saha, E Guha and A K Barua* B1824
Analysis of the $2s^2\ ^1S$, $2p^3\ ^1D$ and $2s2p\ ^1P$ autoionizing levels of helium, in proton–helium collisions *A Bordenave-Montesquie, A Gleizes, M Rodiere and P Benoit-Cattin* B1997
Elastic and inelastic scattering of Li^+ ions by rare gases (Ne, Ar, Kr, Xe) *M Barat, D Dhicq, R Francois and V Sidis* B2072
Formation of H(2p) and H(2s) atoms in collisions of 2–26 keV protons with hydrogen atoms *T V Morgan, J Geddes and H B Gilbody* B2118
Combined theory of classical excitation of atoms by charged particles *I C Percival* B2236
The elastic scattering of positrons by helium in the close coupling approximation *C E Wardle* B2310
The excitation of ^1P states in helium by proton impact *K C Mathur and M R H Rudge* B2555
S-wave positron scattering by hydrogen atoms *Y F Chan and P A Fraser* B2504

5.288 Forces between atoms, interatomic potentials

Dipole and quadrupole three-body interactions in argon *R E Caligaris and A E Rodriguez* BL24
On the long-range hyperfine shift in HeH *P J Fortune and P R Certain* BL39
Measurement of the broadening and shift of the Na–D lines by helium at low pressure *J P Deleage, D Kunth, G Testor, F Rostas and E Roueff* B1892

5.290 Mesic and muonic atoms, atoms containing other particles than normal

Formation of muonium in fast collisions of μ^+ mesons with atomic systems *Dz S Belkic and R K Janev* B2613

5.400 MOLECULES

5.410 Molecular configuration and dimensions

Configuration interaction studies of the low-lying quartet states of N_2^+ *A Andersen and E W Thulstrup* BL211
Spin–orbit coupling and the interaction of molecules with the radiation field *L D Barron and A D Buckingham* B1295
Singlet–triplet differences in the lowest Π_u states of H_2 *E A Colbourn* B2618

5.420 Molecular structure

The Franck–Condon principle for polyatomic molecules *N J D Lucas* B155
Harmonic oscillator integrals *W Witschel* B527

5.422 Orbital LCAO, SCF and variational methods

Approximation to the method of local orbitals *A B Kunz* BL47
Molecular orbital studies of hydrogen chloride *H Itoh and H Hinazumi* BL294
Ab initio study of Cu_2 and Cu_2^+ *P Joyes and M Leyletter* B150
Collinear collision of an atom and a morse oscillator: exact quantum mechanical results *A P Clark and A S Dickinson* B164
Variational approximations to the $2p\sigma_u$ and $2p\pi_u$ wavefunctions of the hydrogen molecule ion *N R Arista and V H Ponce* B511
Molecular orbital calculations for close atomic collisions: the N_2 system *J S Briggs and M R Hayns* B514
Prediction of a predissociation in the $A\ ^2\Sigma^+$ states of HCl^+ and DCl^+ *J Raftery and W G Richards* B1301
Virtual orbitals, excitation energies, and oscillator strengths *N Bjorna* B1412
Theory of the (e, 2e) reaction on molecules *I E McCarthy* B2358
Semiempirical methods in molecules *K S Kulkarni and C R Sarma* B2377

5.426 Electronic structure

The electronic transition moment of the $N_2^+(B\ ^2\Sigma_u^+ \times\ ^2\Sigma_g^+)$ system *L C Lee and D L Judge* BL121
Potential energy curves and spectroscopic constants for some diatomic systems *D J Ellis, K E Banyard, A D Tait and M Dixon* BL233
Energy levels in linear molecules: II *P R Scott, J Raftery and W G Richards* B881

5.428 Vibrations, rotation, force constants

Observation of the effects of rotational transitions in the resonant scattering of electrons from N_2 *J Comer and M Harrison* BL70
Regular and Irregular spectra *I C Percival* BL229
The linewidth of rotational transitions of OCS, CHF_3 and OCS–CHF_3 mixtures *D Olson, C O Britt, V Prakash and J E Boggs* B206

Measured lifetimes of the two vibrational levels of the $b\,^3\Sigma^+$ states of Co *A J Smith R E Imhoff and F H Read* B1333

Rotational inelasticity in polar diatom–atom scattering: application of the semiclassical time-dependent perturbation theory to the Ne–CO and Ne–HCl systems *S Saha, E Guha and A K Barua* B1824

Theory of collision induced rotational energy transfer in the Π-state of diatomic molecules *H Klar* B2139

Model potential calculations on open-shell molecules *C Bottcher* B2368

5.440 Molecular spectroscopy

Analysis of the time-profiles of transient absorption observed in the kinetic spectrophotometry of aromatic hydrocarbons *K A Hodgkinson and I H Munro* B1582

5.441 Bonds, moment, polarizability

Dynamique des hydrogènes dans les liaisons hydrogène des dimères de l'acide acétique *Y Marechal* BL188

5.442 Visible and ultraviolet spectroscopy

Spectre d'excitation du méthane par impact électronique. Observation de vibrations particulières entre 1,5 et 3 eV *E M Dicoum, Fr T Minh et J Bensimon* BL27

A new electronic transition $F\,^2\Sigma^+ – A\,^2\Pi_i$ of AlO *M Singh* B521

On the emission spectrum of molecular SbF *M Chakravorty, K C Abraham and M M Patel* B757

Méthode d'analyse des perturbations par paire dans les spectres électroniques: application aux spectres de AsO de LuO *J N Massot, J P Goure et J Figuet* B1308

A new electronic transition $F\,^1\Pi – X\,^1\Sigma$ of MgO *M Singh* B1339

A band system of the SrI molecule in the region λ3350–λ3560 Å *S G Shah, M M Patel and A B Darji* B1344

Hund's coupling case (c) in diatomic molecules: I. Theory *L Veseth* B1473

Hund's coupling case (c) in diatomic molecules: II. Examples *L Veseth* B1484

The band spectrum of SrI in the region λ6500–λ7200 Å *Ashrafunnisa, D V K Rao and P T Rao* B1503

Further analyses of the emission spectra of arsenic monoxide AsO *V M Anderson and J H Calloman* B1664

The $G\,^1\Pi – X\,^1\Sigma$ and $G\,^1\Pi – A\,^1\Pi$ transitions of MgO *M Singh* B1917

Rotational analysis of the (0, 0) band of the orange–red system of $^{63}Cu^{16}O$ *A Antic-Jovanovic and D S Pesic* B2474

The emission spectra of the AuSi, AuGe, AuSn and AuPb radicals *R Houdart and J Schamps* B2479

A new ultraviolet band system of the SrI molecule *Ashrafunnisa, D V K Rao and P T Rao* B2653

5.443 Vacuum ultraviolet spectroscopy

New emission spectrum of carbon monoselenide *J Lebreton, G Bosser and L Marsigny* BL226

Photoabsorption cross sections of NO in the 380–660 Å region *A Gardner, M Lynch, D T Stewart and W S Watson* BL262

Photoabsorption coefficients of molecular nitrogen in the 300–700 Å region *W S Watson, J Lang and D T Stewart* BL148

5.445 Radiofrequency and microwave spectra

Microwave pressure broadening studies of some molecules *G P Srivastava, H O Guatam and A Kumar* B743

An accurate measurement of the natural decay rate of orthopositronium *P G Coleman and T C Griffiths* B2135

5.447 Fluorescence, radiationless transfer

Spin–orbit coupling and the interaction of molecules with the radiation field *L D Barron and A D Buckingham* B1295

Fluorescence quenching and nonradiative energy transfer in solutions *A Kawski, E Kuten and J Kaminski* B1907

Band strengths for $CO_2^+(A\,^2\Pi_u \rightarrow X\,^2\Pi_g)$ system produced through photoionization excitation of CO_2 *D L Judge and L C Lee* B2151

5.449 Isotope effects

Isotope effects in the predissociation of the $C\,^2\Sigma_u^+$ state of N_2^+ *T R Grovers, C A van de Runstraat and F J De Heer* BL73

5.450 Magnetic resonance and relaxation

On the dielectric second virial coefficient of polar gases *K K Datta and A K Barua* B1327

5.460 Ionization and dissociation recombination

Experimental investigations of ionization growth in nitrogen: I *M A Folkard and S C Haydon* B214

Experimental investigations of ionization growth in nitrogen: II *S C Haydon and O M Williams* B227

Dissociation photoionization of H_2 and D_2 through the $1s\sigma_g$ ionic state *R Browning and J Fryar* B364

5.480 Collision processes and molecular interactions

Classical theory of elastic scattering and vibro-rotational dissociation in N_2^+ on He collisions at moderate energies (0·5 keV–3 keV) *J Baudon* B850

Measurements of integral total cross sections for CsF on Ar, Kr, Xe *R David, W Spoden and J P Toennies* B897

A modified correspondence principle for strongly coupled states *A P Clark* B1153

5.482 Electron scattering, excitation, ionization

One centre molecular study of the single ionization of He by He^+ impact at moderate energy *V Sidis* B1188

On the dissociation of the H_2 molecule following electron impact and leading to the obtention of atomic hydrogen in the $n = 3$ levels *L Julien, M Glas-Maujean and J P Descombes* BL196

Electron–molecule collision ionization in hydrogen and deuterium *I R Cowling and J Fletcher* B665

Electron impact excitation of N_2: I. Resonant phenomena associated with the $A\ ^3\Sigma_u^+$ and $B\ ^3\Pi_g$ valence states *J Mazeau, F Gresteau, R I Hall, G Joyez and J Reinhardt* B862

Electron excitation of N_2: II. Resonant phenomena associated with Rydberg states *J Mazeau, R I Holl, G Joyez, M Landau and J Reinhardt* B873

Secondary ionization by metastable particles in nitrogen *S C Haydon and O M Williams* B1866

Dissociative ionization by electron impact: I. Protons from H_2 *A Crowe and J W McConkey* B2088

Dissociative ionization by electron impact: II. N^+ and N^{++} from N_2 *A Crowe and J W McConkey* B2108

Rotational excitation cross sections for e^-–N_2 scattering *N Chandra and P G Burke* B2355

Collisions between electrons and H_2 ions: IV. Measurements of cross sections for dissociative ionization *B Peart and K T Dolder* B2409

Resonant rotational excitation of H_2 by electron impact *G Joyez, J Comer and F H Read* B2427

A measurement of cross sections for the 1S–2S excitation of He^+ ions by electron impact *K T Dolder and B Peart* B2415

Collisional detachment of electrons and ion molecule reactions in oxygen *B C O'Neill and J D Craggs* B2625

5.484 Energy and spin transfer collisions

Translational energy spectrum of O_2^- ions formed by 4 keV O_2^+ ions impacting on argon *F C Fehsenfeld, J Appell, P Fournier and J Durup* BL268

Theory of collision induced rotational energy transfer in the Π state of diatomic molecules *H Klar* B2139

5.486 Molecular beams

Formation of HCO^+ by the associative ionization of CH + O *M Macgregor and R S Berry* B181

Double charge transfer spectroscopy of diatomic molecules *J Appell, J Durup and P Fournier* B197

One centre molecular study of the single ionization of He by He^+ impact at moderate energy *V Sidis* B1188

Nuclear spin analogue of a molecular beam maser with cavities in series *W H U Krause and D C Laine* B1510

Rotational inelasticity in polar diatom–atom scattering: application of the semi-classical time-dependent perturbation theory to the Ne–CO and Ne–HCl systems *S Saha, E Guha and A K Barua* B1824

Ionization and fragmentation of diatomic molecular gases by 5–45 keV Ne^+ and Na^+ ions and Ne atoms *W G Graham, C J Latimer, R Browning and H B Gilbody* B2601

5.488 Intermolecular forces

Dynamique des hydrogènes dans les liaisons hydrogène des dimères de l'acide acétique *Y Marechal* BL188

Potential energy curves of the $(XeH)^+$ system *C Kubach and V Sidis* B289

Collisional detachment from atmospheric negative ions *R Ranjan and C C Goodyear* B1070

6.000 GASES, FLUID DYNAMICS AND PLASMAS

6.100 PHYSICS OF GASES

6.140 Viscosity diffusion

Diffusion coefficients for n-alkanes in binary gaseous mixtures with nitrogen *W A Wakeham and D H Slater* B886

Electron mobility and localization in dense He^4 gas *H R Harrison, L M Sander and R E Springett* B908

6.500 PLASMA PHYSICS

6.515 Transport, collision and interaction processes in plasmas

Ar^+–Ar momentum transfer cross sections in the range 4–7 eV *J J B Frommelt and I R Jones* BL178

The effect of small variations in the angle between a magnetic field and the discharge tube axis on a rare gas afterglow decay *T L Dutt* BL152

Decay of a high temperature helium plasma: validity of local thermodynamic equilibrium and estimation of recombination coefficients for He^{++}, He^+ and He_2^+ *D E Roberts* B929

A theoretical study of the effects of ion motion spectral lines in plasmas: I. Neutral helium lines *R W Lee* B1044

A theoretical study of the effects of ion motion on spectral lines in plasmas: II. Hydrogen–H_β *R W Lee* B1060

Measurements of the thermal diffusion coefficient for electrons in helium *D K Gibson, R W Crompton and G Cavalleri* B1118

The mobility of potassium ions in gas mixtures *H B Milloy and R E Roberts* B1139

Stark broadening of high quantum number $\Delta n = 1$ transitions of carbon V and VI in a laser-produced plasma *F E Irons* B1562

Calculations of state functions behind ionizing shock-waves in potassium and caesium vapour *R M Hill and E M Jones* B1685

Electron-detachment from alkali–metal negative ions by electron collisions *T L John and B Williams* B1514

6.530 Plasma flow, magnetohydrodynamics

A note on the theory of the flowing afterglow *H M P Stock* BL86

6.550 Plasma production and heating

Measurements of magnetized rare gas afterglow plasmas in the frequency range 200–1500 MHz *T L Dutt* B1129

Electron radiation temperature measurements in a helium afterglow at 300 K *R Deloche, W E Wells, P Monchicourt and J Berlande* B188

6.700 ELECTRIC DISCHARGES

Electron impact ionization of neon and argon *J Fletcher and I R Cowling* BL258

Monte-Carlo investigations of the motion of gaseous ions in electrostatic fields *H R Skullerud* B728

Secondary electron emission by metastable particle impact in ionization growth experiments *S C Haydon and O M Williams* B1856

Secondary ionization by metastable particles in nitrogen *S C Haydon and O M Williams* B1866

Electron radiation temperature measurements in a helium afterglow at 300 K *R Deloche, W E Wells, P Monchicourt and J Berlande* B1881

7.160 Radiation damage and other radiation effects

The stopping power of organic liquids for alpha particles over the energy range 1–8 MeV *R B J Palmer* B384

8.600 MAGNETIC RESONANCE AND RELAXATION, MOSSBAUER EFFECT

Nuclear spin analogue of a molecular beam maser with cavities in series *W H U Krause and D C Laine* B1510

9.500 ASTRONOMY AND ASTROPHYSICS

9.544 Quasars

Excitation of semi-forbidden $2s^22p^2\ ^3P–2s2p^3\ ^3S^o$ and $2s^22p\ ^2P^o–2s2p^2\ ^4P$ lines observed in quasars *A R G Jackson* B2325

Author index with titles

Abbe J Ch: *see* Constantin E BL272

Abraham K C: *see* Chakravorty M B757

Adelman S A: Two-photon detachment cross section of H^- B1986

Adelman S A: *see* Szabo A BL193

Ahlberg R and Goscinski O: Atomic polarizabilities and shielding factors with a local linear response method B2254

Albat R and Gruen N: A derivation of general open-shell SCF equations for atoms and molecules with a green function method B601

Ali Z; *see* Chaghtai M S Z B232

Altick P: *see* Bates D R B653

Aminoff C G: *see* Stenholm S B2390

Amusia M Ya, Cherepkov N A, Janev R K, Sheftel S I and Zivanovic Dj: The role of many electron correlations in fast electron–atom inelastic collisions B1028

Anderson V M and Calloman J H: Further analyses of the emission spectra of arsenic monoxide AsO B1664

Andersen A and Thulstrup E W: Configuration interaction studies of the low-lying quartet states N_2^+ BL211

Ansbacher F: A note on the equivalence of the classical motion of rigid bodies with prescribed angular velocities and the quantum mechanical solutions for paramagnetic atoms in external fields B1618

Ansbacher F: A unitary perturbation method for a paramagnetic atom in a magnetic field with constant and oscillatory components B1620

Ansbacher F: An improved coordinate transformation for the treatment of a paramagnetic atom in a linear oscillatory and a constant transverse magnetic field B1633

Antic-Jovanovic A and Pesic D S: Rotational analysis of the (0, 0) band of the orange–red system of $^{63}Cu^{16}O$ B2473

Appell J, Durup J, Fehsenfeld F C and Fournier P: Double charge transfer spectroscopy of diatomic molecules B197

Appell J: *see* Fehsenfeld F C BL268

Arimondo E and Moruzzi G: Bloch–Siegert shift in optically oriented ^{199}Hg vapour B2382

Arista N R and Ponce V H: Variational approximation to the $2p\sigma_u$ and $2p\sigma_u$ wavefunctions of the hydrogen molecule ion B511

Armstrong L jr and Feneuille S: Influence of photon statistics on the Bloch–Siegert shift BL182

Ashrafunnisa, Rao D V K and Rao P T: The band spectrum of SrI in the region λ6500–λ7200 Å B1503

Ashrafunnisa, Rao D V K and Rao P T: A new ultraviolet band system of the SrI molecule B2653

Baker S C: Terms of NVI and OVII B709

Banyard K B: *see* Ellis D J BL233

Barat M, Brenot J C and Pommier J: Effect of u–g symmetry on direct and exchange excitation in ion–atom scattering BL105

Barat M, Dhuicq D, Francois R, Lesech C and McCarroll R: Ionization processes in He–He collisions B1206

Barat M, Dhuicq D, Francois R and Sidis V: Elastic and inelastic scattering of Li^+ ions by rare gases (Ne, Ar, Kr, Xe) B2072

Barat M: *see* Dhuicq D BL1

Barron L D and Buckingham A D: Spin–orbit coupling and the interaction of molecules with the radiation field B1295

Barua A K: *see* Datta K K B1327

Barua A K: *see* Saha S B1824

Barut A O and Rasmussen W: The hydrogen atom as a relativistic elementary particle: I. The wave equation and mass formulae B1695

Barut A O and Rasmussen W: The hydrogen atom as a relativistic elementary particle: II. Relativistic scattering problems and photo-effect B1713

Bates G N and Altick P L: The photoionization cross section of magnesium fear threshold B653

Bates D R and McKibbin C S: Classical statistical equilibrium constants and distribution functions B2485

Bates D R and Snyder R: Classical free-fall atomic model BL159

Bates D R and Snyder R: Classical treatment of fast atomic collisions B642

Baudon J: Classical theory of elastic scattering and vibro-rotational dissociation in N_2^+ on He collisions at moderate energies (0.5 keV–3 keV) B850

Baudon M: *see* Dhuicq D BL1

Baudon J: *see* Lesech C BL11

Baye D and Heenen P H: A theoretical study of fast proton–atomic hydrogen scattering B105

Baye D and Heenen P H: A theoretical study of proton–helium scattering B1253

Beck D R: *see* Nicolaides C A B535

Beck D R: see Nicholaides C A B62

Begum S, Bransden B H and Coleman J: The use of second order potentials in the theory of scattering of charged particles by atoms: V. Excitation of helium atoms by fast protons and charge exchange B837

Beier H J: The elastic small angle scattering of ions at atoms in the high energy region: I. Theoretical results B683

Beier H: The elastic small angle scattering of ions at atoms in the high energy region: II. Comparison with experimental results B2564

Belkic Dz S and Janev R K: Electron capture from hydrogen and helium atoms by fast alpha particles B1020

Belkic Dz S and Janev R K: Formation of muonium in fast collisions of μ^+ mesons with atomic systems B2613

Bell K L, Kingston A E and Taylor I R: Photoionization of the 2^1S and 2^3S states of helium B2271

Bell K L, Kingston A E and McIlveen W A: Destruction of fast metastable hydrogen atoms passing through atomic helium B1237

Bell K L, Kingston A E and McIlveen W A: Formation of H(2s) and H(2p) in collisions of atomic hydrogen with atomic helium B1246

Bell K L, Kingston A E and Taylor I R: Photoionization of the 1^1S state of helium B1228

Benoit-Cattin P: *see* Rodiere M B1997

Bensimon J: *see* Manguelle Dicoum E BL27

Berlande J: *see* Deloche R B1881

Berrington K A, Bransden B H and Coleman J P: The use of second-order potentials in the theory of the scattering of charged particles by atoms: IV. Electron scattering of helium atoms B436

Berrondo M and Novaro O A: On a geometrical realization of the Aufbau scheme B761

Berry R S: *see* MacGregor M B181

Beyer H-J, Kleinpoppen H and Woolsey J M: Measurement of the non-linear Stark effect in hydrogen-like He^+, $n = 4$ B1849

Bjorna N: Virtual orbitals, excitation energies, and oscillator strengths B1412

Blackman J A and Series G W: The Starkeffect in hydrogen and precision measurements of the Rydberg constant B1090

Blair W G F and Gilbody H B: Excitation of helium by 20–100 keV hydrogen atoms B483

Blair W G F, McCullough R W, Simpson F R and Gilbody H B: Excitation of helium in He^+–He and He–He collisions: the influence of metastable helium atoms B1265

Blanchard P and Drake G W F: Energies and Z-expansion coefficients for the *D* states in the helium sequence B2495

Boggs J E: *see* Olson D S B206

Boring J W: *see* Harberger J H: B1040

Bottcher C: A unified calculation on the Stark broadened profile of Lyman-alpha BL54

Bottcher C: Model potential calculations on open-shell molecules B2368

Boyd R J and Coulson C A: Coulomb hole in some excited states of helium B782

Bradley D J, Ewart P, Nicholas J V and Shaw J R D: Excited state absorption spectroscopy of alkaline earths selectively pumped by tunable dye lasers: I. Barium arc spectra B1594

Braithwaite W J: *see* Moore C F B1592

Bransden B H: *see* Begum S B837

Bransden B H: *see* Berrington K A B436

Bransden B H: *see* Winters K H BL247

Brenot J C: *see* Barat M BL105

Briggs J S and Hayns M R: Molecular orbital calculations for close atomic collisions: the N_2 system B514

Briggs J S and Macek J H: A scaling law for inner-shell excitation cross sections in ion–atom collision B982

Briggs J S: *see* Macek J H B941

Britt C O: *see* Olson D S B206

Browning R and Fryar H: Dissociative photoionization of H_2 and D_2 through the $1s_g$ ionic state B364

Brochard J, Reymann D, and Vetter R: On particular aspects of the competition between emission and absorption in the 3-36 μm xenon line profile BL145

Browne P G and Dunn M H: Metastable densities and excitation processes in the He–Cd laser discharge B1103

Browning R: *see* Graham W G B2641

Buckingham A D: *see* Barron L D B1295

Burgess D D: *see* Mahon R B354

Burke P G and Mitchell J F B: Low energy scattering of electrons by cesium atoms BL161

Burke P G and Mitchell J F B: Electron scattering by atomic hydrogen using a pseudo-state expansion: IV. The convergence of the S-state expansion at intermediate energies B320

Burke P G: *see* Chandra N B2355

Byron F W Jr and C J Joachain: Difficulties with the Faddeev–Watson multiple scattering expansion in atomic physics BL169

Caligaris R E and Rodriguez: Dipole and quadrupole three-body interactions in argon BL24

Calloman J H: *see* Anderson V M B1664

Canter K F, Coleman P G, Griffith T C and Heyland G R: The measurement of total cross sections for positrons of energies 2–400 eV in He, Ne, Ar, and Kr BL201

Capitelli M and Ficocelli V: Collision integrals of carbon–oxygen atoms in different electronic states B1819

Carlsten J L and McIlraith T J: Observations of

stimulated antistokes radiation in barium vapour BL80
Carlsten J L and McIlraith T J: Revised absolute absorption cross section of Ba I at 237·9 nm BL284
Carlsten J L: *see* McIlraith T J B697
Carrington C G, Stacey D N and Cooper J: Multipole relaxation and transfer rates in the impact approximation: Application to the resonance interaction B417
Carse G D and Walker D W: Relativistic theory of electron scattering from hydrogenic systems B2529
Cavalleri G: *see* Gibson D K B1118
Certain F R: *see* Fortune P J BL39
Chaghtai M S Z, Ali Z and Khatoon S: The emission spectrum of yttrium VI B232
Chakravorty M, Abraham K C and Patel M M: On the emission spectrum of molecular SbF B757
Chaghtai M S Z and Hassan V: The ionization potential and the $4s4p^6$ *nl* levels of ^{85}Kr I B433
Champeau R J and Keller J C: Isotope shifts of ^{20}Ne, ^{21}Ne and ^{22}Ne and hyperfine structure of ^{21}Ne in the lines 6096 Å and 6074 Å of neon I BL76
Chan Y F and Fraser P A: S-wave positron scattering by hydrogen atoms B2504
Chandra N and Burke P G: Rotational excitation cross sections for e^-–N_2 scattering B2355
Chang T C: *see* Grein F BL237
Chen J C Y, Ponce V H, and Watson K M: Translational factors in eikonal approximation and their effect on channel couplings B965
Cherepkov N A: *see* Amusia M Ya B1028
Choudhury B J: A comment on the momentum translation approximation for the calculation of transition amplitude for high-order electromagnetic transitions BL37
Choudhury B J: On the validity of momentum translation approximation BL100
Choudhury B J: Low intensity and high intensity limits of the momentum translation approximation BL103
Choudhury B J: Polarization effects in multiphoton ionization of hydrogen from metastable 2s state B2268
Chutjian A: *see* Hall R I BL264
Clark A P: A modified correspondence principle for strongly coupled states B1153
Clark A P and Dickinson A S: Collinear collision of an atom and a morse oscillator: exact quantum mechanical results: B164
Clark C D: *see* Winters K H BL247
Cohen M: *see* McEachran R P BL286
Cohen J S and Lane N F: Calculation of cross sections for chemiionization of H by He (2^1S) and He (2^3S) metastable atoms BL113
Cohen-Tannoudji C, Dupont-Roc J and Fabre C: A quantum calculation of the higher order terms in the Bloch–Siegert shift BL214
Cohen-Tannoudji C, Dupont-Roc J and Fabre C: An experimental check of higher order terms in the radiative shift of a coherence resonance BL218
Colbourn E A: Singlet–triplet differences in the lowest Π_u states of H_2 B2618
Coleman J P: *see* Winters K H BL247
Coleman P G and Griffith T C: An accurate measurement of the natural decay rate of orthopositronium B2155
Coleman J: *see* Begum S B837
Coleman J P: *see* Berrington K A B436
Coleman P G: *see* Canter K F BL201
Collins G J: *see* Green J M B1545
Comer J and Harrison M: Observation of the effects of rotational transitions in the resonant scattering of electrons from N_2 BL70
Comer J: *see* Hicks P J BL65
Comer J: *see* Joyez G B2427
Constantin E and Abbe J Ch: Sur la dissociation des ions $CH_nD_{5-n}^+$ ($n \leqslant 4$) au cours de collisions avec des atomes de gaz rates BL272
Cooper J: *see* Stacey D B417
Cornille M: *see* Naon M B954
Coulson C A and Haskins P J: On the relative accuracies of eigenvalue bounds B1741
Coulson C A: *see* Boyd R J B782
Coulthard M A: Relativistic contributions to screening ratios in europium B23.
Coulthard M A: Relativistic Hartree–Fock calculations of some properties of rare earth atoms and ions B2224
Cowling I R and Fletcher J: Electron molecule collision ionization in hydrogen and deuterium B665
Cowling I R: *see* Fletcher J BL258
Craggs J D: *see* O'Neill B C B2625
Crompton R W: *see* Gibson D K B1118
Crothers D S F: Perturbed symmetric resonance: an exact formula B1418
Crowe A and McConkey J W: Dissociative ionization by electron impact I. Protons from H_2 B2088
Crowe A and McConkey J W: Dissociative ionization by electron impact: II. N^+ and N^{++} from N_2 B2108
Csanak Gy, Taylor H S and Trupathy D N: Many-body theory of the generalized optical potential for electron-atom (molecule) inelastic scattering B2040
Csanak Gy and Taylor H S: Adiabatic limit and nonadiabatic effects in the second order transition potential (semi-empirical analysis) B2055

Darji A B: *see* Shah S G B1344

Datta K K and Barua A K: On the dielectric second virial coefficient of polar gases B1327
David R, Spoden W and Toennies J P: Measurements of integral total cross sections for CsF on Ar, Kr, Xe B897
de Heer F J: *see* Govers T R BL73
Delcroix A and Volonte S: Temperature determination from the relative line-to-continuum intensity of the He II 4686 and 3203 lines BL4
Deleage J P, Kunth D, Testor G, Rostas F and Roueff E: Measurement of the broadening and shift of the Na D lines by helium at low pressure B1892
Deloche R, Wells W E, Monchicourt P and Berlande J: Electron radiation temperature measurements in a helium afterglow at 300 K B1881
Descoubes J P: *see* Julien L BL196
Dewangan D P: Dependence of symmetrical charge transfer cross section on ionization potential BL20
De Witt R N: Circular versus linear polarization in multiphoton ionization of hydrogen BL93
De Witt R N: Application of the momentum translation method to multiphoton ionization of hydrogen by intense electromagnetic fields B803
Dhez P and Ederer D L: Photoionization resonance profile parameters of the $3s3p\ ^1P_1$ two-electron excitation in He I BL59
Dhuicq D, Baudon J and Barat M: Effect of nuclear symmetry in ^4He on ^4He and ^3He on ^3He collisions at moderate energies BL1
Dhuicq D: *see* Barat M B2072
Dhuicq D: *see* Barat M B1206
Dickinson A S: *see* Clark A P B164
Dixon M: *see* Ellis D J BL233
Dmitriev I S: *see* Volodyagin Yu S BL171
Dolder K T and Peart B: A measurement of cross sections for the 1S–2S excitation of He^+ ions by electron impact B2415
Dolder K T: *see* Peart B B146
Dolder K T: *see* Peart B B1497
Dolder K T: *see* Peart B B2469
Donaldson T P, Hutcheon R J and Key M H: Electron temperature and ionization state in laser produced plasmas B1525
Drake G W F: *see* Blanchard P B2495
Dubau J and Wells J: Calculated photoionization cross sections for Be and Mg BL31
Dubau J and Wells J: Quantum defect theory: X photoionization B1452
Dunn M H: *see* Browne P G B1103
Dupont-Roc J: *see* Cohen-Tannoudji C BL214
Dupont-Roc J: *see* Cohen-Tannoudji C BL218
Düren R: Differential cross sections for alkali-halogen collisions from trajectory calculations on intersecting surfaces B1801
Durup J: *see* Appell J B197
Durup J: *see* Fehsenfeld P BL268
Dutt T L: The effect of small variations in the angle between a magnetic field and the discharge tube axis on a rare gas afterglow decay BL152
Dutt T L: Measurements of magnetized rare gas afterglow plasmas in the frequency range 200–1500 MHz B1129
Düweke M, Kirchner N, Reichert E and Staudt E: Resonances in low energy electron–mercury scattering BL208
Dyson N A: The production of characteristic x rays by proton bombardment, and the ratio of characteristic to continuous radiation B562

Ederer D L: *see* Dhez P BL59
Edmonds A R: Studies of the quadratic Zeeman effect: I. Application of the strurmian functions B1603
Elliott D O: *see* Kauffman R L B2198
Ellis D J, Banyard K B, Tait A D and Dixon M: Potential energy curves and spectroscopic constants for some diatomic systems BL233
Ermolaev A M and Jones M: A perturbation analysis of current methods of calculating relativistic energies B1
Ewart P: *see* Bradley D J B1594

Fabre C: *see* Cohen-Tannoudji C BL214
Fabre C: *see* Cohen-Tannoudji C BL218
Faisal F H M: Multipole absorption of laser photons by atoms BL89
Faisal F H M: Multiphoton transitions: IV. Bound–free transition integrals in compact forms B553
Faisal F H M: *see* Rahman N K B559
Farago P S and Walker D W: Two-photon ionization of trivalent atoms as a source of polarized electrons BL280
Farghaly A S: Calculation of relative oscillator strengths of spectral lines from atomic self-absorption data B1288
Fehsenfeld F C, Appell J, Fournier P and Durup J: Transitional energy spectrum of O_3^- ions formed by 4 keV O_3^+ ions impacting on argon L268
Fehsenfeld F C: *see* Appell J B197
Fenouille S: *see* Armstrong L jr BL182
Ficocelli V: *see* Capitelli M B1819
Figuet J: *see* Massot J N B1308
Fink R W: *see* McGeorge J C B573
Fischer C Froese: Brillouin's theorem for excited $(nl)^q(n'l')^{q'}$ configurations B1933
Fletcher J and I R Cowling: Electron impact ionization of neon and argon BL258
Fletcher J: *see* Cowling I R B2258
Folkard M A and Haydon S C: Experimental investigations of ionization growth in nitrogen: I B214
Fortner R J: *see* Garcia J D BL174

Fortune P J and Certain P R: On the long-range hyperfine shift in HeH BL39
Fournier P: *see* Appell J B197
Fournier P: *see* Fehsenfeld P BL268
Francois R: *see* Barat M B1206
Francois R: *see* Barat M B2072
Fraser P A: *see* Chan Y F B2504
Frommelt J J B and Jones I R: Ar^+–Ar momentum transfer cross sections in the range 4–7 eV BL178
Fryar H: *see* Browning R B364
Furness J B and McCarthy I E: The optical model for 100 eV elastic electron scattering on argon BL42
Furness J B and McCarthy I E: The (e, 2e) experiment as a probe for atomic structure BL204
Furness J B and McCarthy I E: Semiphenomenological optical model for electron scattering on atoms B2286

Gabriel A H and Volonte S: Measurement and interpretation of plasma polarization shift for members of the resonance series of ionized helium B2684
Galanti M: *see* Peacock N J BL298
Gallaher D F: *see* Msezane A B2334
Garcia J D and Fortner R J: On the analysis of unresolved inelastic energy loss spectra in ion–atom collisions BL174
Gardner A, Lynch M, Stewart D T and Watson W S: Photoabsorption cross sections of NO in the 380–660 Å region BL262
Gaussorgues C: Differential scattering cross section for excitation in He^+Ne collisions B675
Gautam H O: *see* Srivastava G P B743
Gayet R, Janev R K and Salin A: Electron detachment from negative ions by charged particle collision: I. Proton impact B993
Geddes J: *see* Morgan T J B2118
Gerber G, Morgenstern R and Niehaus A: Ionization processes in slow collisions of heavy particles: II. Symmetrical systems of the rare gases He, Ne, Ar, Kr B493
Gerber G, Niehaus A and Steffan B: Ion spectra from slow collisions of He^+ with He, Ne Ar and Ne^+ with Ne B1836
Gerjouy E: *see* Shakeshaft R B794
Gerjouy E: *see* Tai H B1426
Ghosh A S: *see* Saha B S BL252
Ghosh A S: *see* Saha B C B2303
Gibson D K, Crompton R W and Cavalleri G: Measurements of the thermal diffusion coefficient for electrons in helium B1118
Gilbody H B: *see* Blair W G F B483
Gilbody H B: *see* Blair W G F B1265
Gilbody H B: *see* Geddes J B2118
Gilbody H B: *see* Graham W G B2641

Gillespie E S: Double excitation of helium by electron impact B2321
Glass-Maujean M: *see* Julien L BL196
Gleizes A, Rodiere M and Benoit-Cattin P: Analysis of the $2s^2$ 1S, $2p^2$ ^{1}P autoionizing levels of helium, in proton–helium collisions B1997
Goodyear C C: *see* Ranjan R B1070
Gopal S and Sanjeevaiah B: Incoherent scattering of γ rays in C, Al, Cu, Su and Pb B2441
Goscinski O: *see* Ahlberg R B2254
Goure J P: *see* Massot J N B1308
Gobers T R, van de Runstraat C A and de Heer F J: Isotope effects in the predissociation of the $c^2\Sigma_u^+$ state of N_2^+ BL73
Graham W G, Latimer C J, Browning R and Gilbody H B: Ionization and fragmentation of diatomic molecular gases by 5–45 keV Ne^+ and Na^+ ions and Ne atoms B2641
Green J M, Collins G J and Webb C E: Collisional excitation and destruction of excited Zn II levels in a helium afterglow B1545
Green J M: *see* Turner-Smith A B B114
Grein F and Chang T C: Single excitation in multi configuration wavefunctions: ground states of the atoms Be to F BL237
Gresteau F: *see* Mazeau J B862
Griffith T C: *see* Canter K F BL201
Griffith T C: *see* Coleman P G B2155
Gruen N: *see* Albat R B601
Grujic P: Threshold behaviour of e–H collisional excitation function: classical treatment B286
Gryzinski M, J Kunc and M Zgorzelski: Three-body analysis of electron–hydrogen atom collision B2292
Guha E: *see* Saha S B1824

Haddad G N and McWhirter R W P: Measurements of excitation rate coefficients for some Ne VIII lines B715
Hall R I, Chutjian A and Trajmar S: Electron impact excitation and assignment of the low-lying electronic states of CO_2 BL264
Hall R I: *see* Mazeau J B862
Hall R I: *see* Mazeau J B873
Hannaford P, Pegg D T and Series G W: Analytical expressions for the Bloch–Siegert shift BL222
Hansen J E: LS term dependence of Slater integrals in p–p configurations: I. Hartree–Fock calculations for individual terms of the $np^3n'p$ configurations in the Ne I and Ar I isoelectronic sequences B1387
Hansen J E: *LS*-term dependence of Slater integrals in p^4p' configuration: II. Deviations from the single configuration approximation in the $np^5n'p$ configurations B1751
Hansen J E: *LS*-term dependence of Slater integrals in p^4p' configurations: III. Deviations from the

single-configuration approximation in the $2p\,^4 3p$ configurations B1967
Harberger J H, Johnson R E and Borin J W: Comparison of binary-encounter and Born approximation for incident neutral systems B1040
Harrison M: *see* Comer J BL70
Harrison H R, Sander L M and Springett B E: Electron mobility and localization in dense He^4 gas B908
Haskins P J: Some S state energies for He and Li^+ using a simple correlated trial function B2220
Haskins P J: *see* Coulson C A B1741
Hassan V: *see* Chaghtai M S Z B433
Haydon S C and Williams O M: Experimental investigations of ionization growth in nitrogen: II. B227
Haydon S C and Williams O M: Secondary electron emission by metastable particle impact in ionization growth experiments B1856
Haydon S C and Williams O M: Secondary ionization by metastable particles in nitrogen B1866
Haydon S C: *see* Folkard M A B214
Hayns M R: *see* Briggs J S B514
Heenen P H: *see* Baye D B1253
Heenen P H: *see* Baye D B105
Heindorff T, Höfft J and Reichert E: Spin polarization by electron resonance scattering from neon B477
Hershkowitz M D and Seaton M J: The calculation of resonances in electron–ion scattering using the distorted wave approximation B1176
Heyland G R: *see* Canter K F BL201
Hibbert A: Oscillator strengths in the beryllium sequence BL127
Hicks P J, Comer J and Read F H: Autoionizing transitions in N_2 and H_2 produced by electron impact BL65
Hidalgo M B, Nuttall J and Stagat R W: The rate of convergence of the Fredholm method B1364
Hidalgo M B, Nuttall J and Stagart R W: Asymptotic expansion of the wavefunction for e–H scattering B1371
Hill R M and Jones E M: Calculations of state functions behind ionizing shock-waves in potassium and caesium vapour B1685
Hinazumi H: *see* Itoh H BL294
Hobby M G: *see* Pescock N J BL298
Hodge B, Kauffman R, Moore C F and Richard P: Scandium K_α and K_β diagram, satellite and hypersatellite x rays B2468
Hodgkinson K A and Munro I H: Analysis of the time-profiles of transient absorption observed in the kinetic spectrophotometry of aromatic hydrocarbons B1582
Hofft J: *see* Heindorff T B477
Holmen E and Midthal J: Feshbach-type $^3P^o$ autoionizing states of H^- B1992
Holt A R and Santoso B: A comparison of the second Born approximation using plane-wave and final-state Green functions B254
Holt A R and Santoso B: The Fredholm integral method: II. The calculation of scattering amplitudes for potential scattering B2010
Hopkins F F: *see* Kauffman R L B2198
Horak Z J: *see* Laughlin C B1953
Houdart R and Schampa J: The emission spectra of the AuSi, AuGe, AuSu and AuPb radicals B2478
Houston S K: Simplified model for the scattering of zero energy electrons by helium atoms B131
Houston S K: Variational calculations of the positron–helium scattering length using approximate target wavefunctions B136
Howard J S, Riola J P, Rundel R D and Stebbings R F: Chemiionization in collisions of He (2^3S) and He (2^1S) metastable atoms with H and H_2 BL109
Hutcheon R J and McWhirter R W P: The intensities of the resonance lines of highly ionized hydrogenlike ions B2668
Hutcheon R J: *see* Donaldson T P B1525
Hvelplund P: *see* Pedersen E H B1277
Hvelplund P: *see* Pedersen E H B2600

Imhoff R E: *see* Smith A J B1333
Irons F E: Stark broadening of high quantum number $\Delta n = 1$ transitions of carbon V and VI in a laser-produced plasma B1562
Itoh H and Hinazumi H: Molecular orbital studies of hydrogen chloride BL294

Jackson A R G: Excitation of semi-forbidden $2s^2 2p^2\ ^3P–2s2p^3\ ^5S^o$ and $2s^2 2p\ ^2P^o–2s2p^2\ ^4P$ lines observed in quasars B2325
Jacobs V L: Polarization phenomena in multiphoton ionization of atoms B1461
Jamison K A: *see* Kauffman R L B2198
Janev R K: *see* Amusia M Ya B1028
Janev R K: *see* Belkic Dz S B1020
Janev R K: *see* Belkic Dz S B2613
Jhanwar B L and Khare S P: Mean energy loss per ion pair and stopping power of helium gas for electrons B462
Joachain C J: *see* Byron F W jr BL169
Joachain C J and Vanderpoorten R: Inelastic scattering of electrons and protons by atoms at intermediate energies B622
John T L, Morgan D J and Williams A R: Multichannel effects on the free–free transitions of Li^- at the infra-red threshold BL225
John T L and Williams B: Electron detachment from alkali–metal negative ions by electron collisions B1814

Johnson R E: *see* Harberger J H 1040
Jones M: *see* Ermolaev A M B1
Jones I R: *see* Frommelt J J B BL178
Jones E M: *see* Hill R M 1685
Joshi S K: *see* Tripathi A N B1431
Joyes P and Leleyter M: *ab initio* study of Cu_2 and Cu_2^+ B150
Joyez G, Comer I and Read F H: Resonant rotational excitation of H_2 by electron impact B2427
Joyez G: *see* Mazeau J B862
Joyez G: *see* Mazeau J B873
Judge D L and Lee L C: Band strengths for the CO_2^+ ($A\,^2\Pi_u$ $X\,^2\Pi_g$) system produced through photoionization excitation of CO_2 B2150
Judge D L: *see* Lee L C BL121
Julien L, Glass-Maujean M and Descoubes J P: On the dissociation of the H_2 molecule following electron impact and leading to the obtention of atomic hydrogen in the $n = 3$ levels BL196

Kaijser P and Linderberg J: Calculation of lifetimes for states of Ti B1975
Kaldor U: Stark effect in the Li hyperfine structure B71
Kaminski J: *see* Kawski A B1907
Kappoor Q S: *see* Nigam A N B2464
Kauffman R L, Woods C W, Hopkins F F, Elliot D O, Jamison K A and Richard P: X-ray decay energies of highly ionized fluorine atoms B2198
Kauffman R: *see* Hodge B B2468
Kawai T: *see* Kondow BL156
Kawski A, Kuten E and Kaminski J: Fluoresence quenching and nonradiative energy transfer in solutions B1907
Keller J C: Parametric study of isotope shifts in Ne I B1771
Keller J C: *see* Champeau R J BL76
Key M H: *see* Donaldson T P B1525
Khare S P: *see* Jhanwar B L B462
Khateeb A H: *see* Omidvar K B341
Khatoon S: *see* Chaghtai M S Z B232
Kibble B P, Rowley W R C, Shawyer R E and Series G W: An experimental determination of the Rydberg constant B1079
Killingbeck J: Operator expectation values in 1/Z perturbation theory BL142
Killingbeck J: A simple perturbation-variational calculation for $1s^2\,{}^1S$ B1376
Kingston A E: *see* Bell K L B1228
Kingston A E: *see* Bell K L B1237
Kingston A E: *see* Bell K L B1246
Kingston A E: *see* Bell K L B2271
Kirchner N: *see* Duwecke M BL208
Klar H: Theory of collision induced rotational energy transfer in the Π-state of diatomic molecules B2139
Kleinpoppen H: *see* Beyer H-J B1849
Knapp E W: The influence of the Pauli exclusion principle on electron impact ionization of light atoms B2516
Knowles M and McDowell M R C: Elastic scattering of slow electrons by helium B300
Kollar J and Solt G: Simple analytical wavefunctions for the ions of the iron group elements B329
Kondow T, Kawai T, Kunimori K, Onishi T and Tamaru K: High resolution $L_{2,3}M_{2,3}M_{2,3}$ auger electron spectra of argon BL156
Krause W H U and Laine D C: Nuclear spin analogue of a molecular beam maser with cavities in series B1510
Kubach C and Sídis V: Potential energy curves of the $(XeH)^+$ system BL289
Kulkarni K S and Sarma C R: Semi-empirical methods in molecules B2377
Kumar A: *see* Srivastava G P B743
Kunc J: *see* Gryzinski M B2292
Kunimori K: *see* Kondow T BL156
Kunth D: *see* Deleage J P B1892
Kunz A B: Approximation to the method of local orbitals BL47
Kurittu L: *see* Latvamaa E B591
Kuten E: *see* Kawski A B1907

Labarthe J J: Correlation effects on specific isotope shifts B1761
Laine D C: *see* Krause W H U B1510
Landau M: *see* Mazeau J B873
Lane N F: *see* Cohen J S BL113
Larkins F P: Krypton M-shell Auger and Coster–Kronig electron energies B1556
Larkins F P: Charge state dependence of x ray and Auger-electron emission spectra for rare-gas atoms: III. Krypton atom M-shell B2450
Latimer C J: *see* Graham W G B2641
Latvamaa E, Kurittu L, Pyykko P and Tataru L: On second-order magnetic hyperfine interactions in one-electron atoms: connections between the Schrödinger, Dirac and quantum electrodynamical perturbation calculations B591
Laughlin C: Nuclear charge expansion method for $1snl^{1,3}$ L–$1sn'l'^{1,3}$L' transitions in the helium isoelectronic sequence B1942
Laughlin C, Lewis M N and Horak Z J: Transition probabilities in the lithium isoelectronic sequence B1953
Learner R C M: *see* Newsom G H 2163
Lebreton J, Rosser G and Marsigny L: New emission spectrum of carbon monoselenide BL226
Lee L C and Judge D L: The electronic transition moment of the N_2^+ ($B\,^2\Sigma_u^+ \rightarrow X\,^2\Sigma_g^+$) system BL121

Lee L C: *see* Judge D L B2150
Lee R W: A truncation technique for the real time two-particle Green function hierarchy B406
Lee R W: A theoretical study of the effects of ion motion on spectral lines in plasmas: I. Neutral helium lines B1044
Lee R W: A theoretical study of the effects of ion motion on spectral lines in plasmas: II. Hydrogen-H_β B1060
Lee R W: *see* Mahon R B354
Leleyter M: *see* Joyes P B150
Lesech C, McCarroll R and Baudon J: Charge exchange in Li^+–He collisions BL11
Lesech C: *see* Barat M B1206
Lewis M N: *see* Laughlin C B1953
Linderberg J: *see* Kaijser P B1975
Liu J W and Smith V H, jr: The differential cross section for elastic scattering of electrons by H_2 in the first Born approximation BL275
Lloyd C R: *see* Teubner P J O B2134
Lucas N J D: The Franck–Condon principle for polyatomic molecules B155
Luke T M: Autoionization states in the photoionization of neon B30
Lynch M: *see* Gardner A BL262

McCarroll R: *see* Barat M B1206
McCarroll R: *see* Lesech C BL11
McCarthy I E: Theory of the (e, 2e) reaction on molecules B2358
McCarthy I E: *see* Furness J B BL42
McCarthy I E: *see* Furness J B BL204
McCarthy I E: *see* Furness J B B2286
McConkey J W and Preston J A: Autoionizing states in argon BL138
McConkey J W: *see* Crowe A B2088
McConkey J W: *see* Crowe A B2108
McCullough R W: *see* Blair W G F B1265
McDowell M R C, Morgan L A and Myerscough P: Electron impact excitation of H and He^+: I. $1s \rightarrow ns$ transitions B1435
McDowell M R C: *see* Knowles M B300
McDowell M R C: *see* Phillips D H BL165
McDowell M R C: *see* Woolings M J B450
McEachran R P, Rotenberg A and Cohen M: Some energy levels and matrix elements of the three-dimensional quartic oscillator BL286
McGeorge J C, Nix D W and Fink R W: Coster–Kronig and fluorescence yields for the L_2 and L_3 subshells in the high-Z region B573
MacGregor M and Berry R S: Formation of HCO^+ by the associative ionization of CH+O B181
McIlraith T J and Carlsten J L: Production of large numbers of atoms in selected state by laser optical pumping: Calcium B697
McIlraith T J: *see* Carlsten J L BL80
McIlraith T J: *see* Carlsten J L BL289
McIlveen W A: *see* Bell K L B1237
McIlveen W A: *see* Bell K L B1246
McKibbin C S: *see* Bates D R B2485
McWhirter J D G and Moiseiwitsch B L: Virial theorem for elastic scattering of electrons and positrons by helium B2489
McWhirter R W P: *see* Haddad G N B715
McWhirter R W P: *see* Hutcheon R J B2668
Macek J H and Briggs J S: Vacancy occupation probabilities in ion–atom collisions B841
Macek J H: *see* Briggs J S B982
Macek J: *see* Shakeshaft R B794
Mahon R, Lee R W and Burgess D D: Experimental and theoretical studies on non-adiabatic ion dynamic contributions to the He I 4026 2^3P–5^3D, 5^3F profile at low electron densities B354
Manguelle Dicoum E, Tran Minh Fr and Bensimon J: Spectre d'excitation du méthane par impact électronique, observations de vibrations particulières entre 1,5 et 3 eV BL27
Marechal Y: Dynamiques des hydrogènes dans les liaisons hydrogène des dimères de l'acide acetique BL188
Marsigny L: *see* Lebreton J BL226
Marwick A D: Recoil effects in C–K x ray production by 60–250 keV copper ion bombardment of graphite B2445
Massot J N, Goure J P and Figuet J: Méthode d'analyse des perturbations par paire dans les spectres électroniques: application aux spectres des AsO et de LuO B1308
Mathur K C and Rudge M R H: The excitation of ^1P states in helium by proton impact B2555
Mathur K C and Rudge M R H: A calculation of exchange cross sections in helium B2545
Mathur K C: *see* Tripathi A N B1431
Matthews D L: *see* Moore C F B1592
Mazeau J, Gresteau F, Hall R I, Joyez G and Reinhardt J: Electron impact excitation of N_2: I. Resonant phenomena associated with the $A\,^3\Sigma_u^+$ and $B\,^3\Pi_g$ valence states B862
Mazeau J, Hall R I, Joyez G, Landau M and Reinhardt J: Electron excitation of N_2: II. Resonant phenomena associated with Rydberg states B873
Midthal J: *see* Holoien E B1992
Milloy H B and Robson R E: The mobility of potassium ions in gas mixtures B1139
Mitchell J F B: *see* Burke P G BL161
Mizuno J: Two-photon ionization of Li, Na and K with polarized photons B314
Mohan Man and Thareja R K: Multiphoton ionization of hydrogen atom in intense laser beam B809
Mohan Man: Simultaneous multiphoton ionization and excitation of helium in an intense laser beam B1218
Mohan M and Thareja R K: Double ionization of the helium atom involving absorption of

many-photons from an intense laser beam B2660
Moiseiwitsch B L: *see* McWhirter J D G B2489
Monchicourt P: *see* Deloche R B1881
Moore C F, Braithwaite W J and Matthews D L: Lyman x rays from a highly stripped nitrogen beam B1592
Moore C F and Wolter H: Observation of chlorine K_α satellite and hypersatellite and K_β satellite transitions BL124
Moore C F: *see* Hodge B B2468
Morgan D J: *see* John T L BL255
Morgan L A: *see* McDowell M R C B1435
Morgan T J, Geddes J and Gilbody H B: Formation of H(2p) and H(2s) atoms in collisions of 2–26 keV protons with hydrogen atoms B2118
Morgenstern R: *see* Gerber G B493
Morrison J C: Many-body calculations for the heavy atoms III. Pair correlations B2205
Moruzzi G: *see* Arimondo E B2382
Mount K E: Potential scattering cross sections in the semiclassical limit B1397
Msezane A and Gallaher D F: Close coupling calculations for massive ion–hydrogen atom collisions in the linear trajectory model B2334
Mukherjee S C, Roy K and Sil N C: Electron capture and excitation in He^{++}–He collisions B467
Munro I H: *see* Hodgkinson K A B1582
Murakami Y: *see* Tsukada N B2605
Myerscough P: *see* McDowell M R C B1452

Naon M and Cornille M: Correlated radial momentum distributions $J(p)$ and Compton profiles $J(q)$. The (^{1}S) Be and (^{1}S) Ne atoms ground states: B954
Naon M and Cornille M: The importance of electronic correlations for the calculation of x ray and fast electron scattering by Be, B, C, N, O, F: II B1347
Nash J C: Transition moment integrals and the hypervirial theorem: II B393
Newsom G H, O'Connor and Learner R C M: Re-examination of the spectrum of strontium: autoionization in the spectrum of neutral strontium B2163
Nicolaides C A and Beck D R: Variational calculations of correlated wavefunctions and energies for ground, low-lying as well as highly excited discrete states in many-electron atoms using a new atomic structure theory including electron correlation B535
Nicolaides C A, Beck D R and Sinagoglu O: Theoretical oscillator strengths for the beryllium $1s^2\,2s^2\,{}^1S–1s^2\,2s2p\,{}^1P^o$, $1s^2\,2s2p\,{}^1P^o–1s^2\,2p^2\,{}^1D$ and $1s^2\,2s2p\,{}^1P^o–1s^2\,2p^2\,{}^1S$ isoelectronic sequences B62
Nicholas J V: *see* Bradley D J B1594
Nicholls P S and Winters K H: Inelastic electron–helium scattering at large angles BL250
Niehaus A: *see* Gerber G B493
Niehaus A: *see* Gerber G B1836
Nigam A N and Kappoor Q S: New diagram lines in the γ-region of the L spectrum of holmium 67 B2464
Nikolaev V S, Senashenko V S, and Shafer V Yu: The effect of the electron bound state structure on ionization cross sections in atomic collisions B1779
Nikolaev V S: *see* Volodyagin Yu S BL171
Nishimura F: *see* Tahira S B2306
Nix D W: *see* McGeorge J C B573
Norcross D W and Seaton M J: Asymptotic solutions of the coupled equations of electron–atom collision theory for the case of some channels closed B614
Novaro O A: *see* Berrondo M B761
Nuttall J: *see* Hidalgo M B BI364
Nuttall J: *see* Hidalgo M B BI371

O'Connor S: *see* Newsom G H B2163
Oda N: *see* Tahira S B2306
Ogawa T: *see* Tsukada N B1643
Ogawa T: *see* Tsukada N B2605
Olson D S, Britt C O, Prakash V and Boggs J E: The linewidth of rotational transitions of OCS, CHF_3 and OCS–CHF_3 mixtures B206
Omidvar K and Khateeb A H: Inelastic collision of fast charged particles with arbitrary levelled hydrogen-like atoms B341
O'Neill B C and Craggs J D: Collisional detachment of electrons and ion molecule reactions in oxygen B2625
Onishi T: *see* Kondow T BL156
Ottewell D, Stewardson E A and Wilson J E: The $M_{4,5}$ spectrum of ^{58}Ce and the γ–α phase transition B2185
Outred M and Pillow M E: Some observations on the decay of the Lewis–Rayleigh afterglow in a nitrogen–oxygen mixture B2701

Palmer R B J: The stopping power of organic liquids for alpha particles over the energy range 1–8 MeV B384
Patel M M: *see* Chakravorty M B757
Patel M M: *see* Shah S G B1344
Peacock N J, Hobby M G and Galanti M: Satellite spectra for helium-like ions in laser-produced plasmas BL298
Peart B and Dolder K T: Measurements which indicate the existence of a second short-lived state of H^{2-} B1497

Peart B and Dolder K T: Collisions between electrons and H_2 ions: IV. Measurements of cross sections for dissociative ionization B2469
Peart B, Stevenson J G and Dolder K T: Measurements of cross sections for the ionization of Ba^+ by energy resolved electrons B146
Peart B: *see* Dolder K T B2415
Pedersen E H and Hvelplund P: Electron-loss cross sections of lithium atoms in gases B1277
Pedersen E H and Hvelplund P: Electron detachment for 50 keV He^- ions leading to metastable and ground-state atoms B2600
Pegg D T: Misalignment effects in magnetic resonance B241
Pegg D T: Semi-classical model of magnetic resonance in intense RF fields B246
Pegg D T: *see* Hannaford P BL222
Percival I C: Regular and irregular spectra BL229
Percival I C: Classical cross sections for collisions between electrons and hydrogen atoms at intermediate energies B93
Percival I C: Combined theory of classical excitation of atoms by charged particles B2236
Pesic D S: *see* Antic-Jovanovic A B2473
Phillips D H and McDowell M R C: The capture amplitude for the ionization of He by electron impact BL165
Pillow M E: *see* Outred M B2701
Piper J A and Webb C E: Continuous-wave laser oscillation in singly ionized arsenic BL116
Pommier J: *see* Barat M BL105
Ponce V H: *see* Arista N R B511
Ponce V H: *see* Chen J C Y B965
Prakash V: *see* Olson D S B206
Preston J A: *see* McConkey J W BL138
Pyykko P: *see* Latvamaa E B591

Raftery J and Richards W G: Prediction of a predissociation in the $A\,^2\Sigma^+$ states of HCl^+ and DCl^+ B1301
Rahman N K and Faisal F H M: Bound–free transitions in electro magnetic field of arbitrary intensity B559
Rai D: *see* Roy B N B816
Ranjan R and Goodyear C C: Collisional detachment from atmospheric negative ions B1070
Rao D V K: *see* Ashrafunnisa B1503
Rao P T: *see* Ashrafunnisa B2653
Rao D V K: *see* Ashrafunnisa B2653
Rasmussen W: *see* Barut A O B1695
Rasmussen W: *see* Barut A O B1713
Read F H and Soto-Monteil J R: The least squares method applied to scattering problems BL15
Read F H: *see* Hicks P J BL65
Read F H: *see* Joyez G B2427
Read F H: *see* Smith A J B1333
Rebelo I: The first order Hartree–Fock equations for the *nsns* ^1S states of helium-like ions B1382
Reichert E: *see* Duweke M BL208
Reichert E: *see* Heindorff T B477
Reid R G H: Transitions among the $3p^2p$ states of sodium induced by collisions with helium B2018
Reinhardt J: *see* Mazeau B862
Reinhardt J: *see* Mazeau J B873
Reymann D: *see* Brochard J BL145
Richard P: *see* Hodge B B2468
Richard P: *see* Kauffman R L B2198
Richards D: Excitation of highly excited hydrogenic ions and atoms by charged particles: IV B823
Richards W G: *see* Raftery J B1301
Richards W G: *see* Scott P R B881
Riola J P: *see* Howard J S BL109
Robb W D: Calculation of the dynamic dipole polarizabilities and Van der Waals coefficients of beryllium and carbon atoms in the ground B945
Roberts D E: Decay of a high temperature helium plasma: validity of local thermodynamic equilibrium and estimation of recombination coefficients for He^{++}, He^+ and He_2^+ B929
Robson R E: *see* Milloy H B B1139
Rodriguez A E: *see* Caligaris R E BL24
Rodiere M: *see* Gleizes A B1997
Rosser G: *see* Lebreton J BL226
Rostas F: *see* Deleage J P B1892
Rotenberg A: *see* McEachran R P BL286
Roueff E L *see* Deleage J P B1892
Rowley W R C: *see* Kibble B P B1079
Roy B N and Rai D K: Application of classical collision theory to electron impact double ionization of atoms B816
Roy K: *see* Mukherjee S C B467
Rudge M R H: Variational methods in potential scattering B1788
Rudge M R H: *see* Mathur K C B2555
Rudge M R H: *see* Mathur K C B2545
Rundel R D: *see* Howard J S BL109

Saha B S, Ghosh A S and Sil N C: Elastic and 2s,2p excitation cross sections of hydrogen atom by the Faddeev approach BL252
Saha S, Guna E and Barua: Rotational inelasticity in polar diatom–atom scattering: application of the semi-classical time-dependent perturbation theory to the Ne–CO and Ne–HCl systems B1824
Saha B C, Sarkar K and Ghosh A S: Scattering of electrons by hydrogen and helium atoms using the eikonal approximation B2303
Salin A: Coulomb effects in the final state of an ionizing collision between electrons and helium atoms BL34
Sander L M: *see* Harrison H R B908

Sanders J H and Thomson J E: New high-gain transitions in neon B2178
Sanjeevaiah B: *see* Gopal S B2441
Santoso B: *see* Holt A R B254
Santoso-B: *see* Holt A R B2010
Saraph H E: Calculation of electron scattering by neutral oxygen, using an accurate representation for the target BL243
Sarkar K: *see* Saha B C B2303
Sarma C R: *see* Kulkarni K S B2377
Schamps J: *see* Houdart R B2478
Schulz M: Influence of the effective charges on the five-fold differential cross section for ionization of hydrogen and helium B2580
Scott P R, Raftery J and Richards W G: Energy levels in linear molecules: II B881
Seaton M J: *see* Hersshkowitz M D B1176
Seaton M J: *see* Norcross D W B614
Senashenko V S: *see* Nikolaev V S B1779
Series G W: *see* Hannaford P BL222
Series G W: *see* Kibble B P B1079
Shafer V Yu: *see* Nikolaev V S B1779
Shah S G, Patel M M and Darji A B: A band system of the SrI molecule in the region λ3350–λ3560 Å B1344
Shakeshaft R: Equivalence of wave and impact parameter Born expansion BL357
Shakeshaft R: Variational continuum distorted wave approximation: Proton hydrogen charge transfer at very high energies B2315
Shakeshaft R, Macek J and Gerjuoy E: Time-reversal in the impact parameter method B794
Shaw J R D: *see* Nicholas J V B1594
Shawyer R E: *see* Kibble B P B1079
Sheftel S I: *see* Amusia M Ya B1028
Shore B W: Use of the Rayleigh–Ritz–Galerkin method with cubic wavefunctions: the hydrogen atom and its spectrum B1923
Sidis V: One centre molecular study of the single ionization of He by He^+ impact at moderate energy B1188
Sidis V: *see* Barat M B2072
Sidis V: *see* Kubach C BL289
Sil N C: *see* Mukherjee S C B467
Sil N C: *see* Saha B S BL252
Simpson F R: *see* Blair W G F B1265
Sinagoglu O: *see* Nicolaides C A B62
Singh M: The $c\ ^1\Pi$–$x\ ^1\Sigma$ and $c\ ^1\Pi$–$A\ ^1\Pi$ transitions of MgO B1917
Singh M: A new electronic transition $F\ ^2\Sigma^+$–$A\ ^2\Pi_i$ of AlO B521
Singh M: A new electronic transition $F\ ^1\Pi$–$X\ ^1\Sigma$ of MgO B1339
Skullerud H R: Monte-Carlo investigations of the motion of gaseous ions in electrostatic fields B728
Skullerud H R: Mobility, diffusion and interaction potential for potassium ions in argon B918
Slater D H: *see* Wakeham W A B886
Smith A J, Imhoff R E and Read F H: Measured lifetimes of the two vibrational levels of the $b^3\Sigma^+$ state of CO B1333
Smith V H, jr: *see* Liu J W BL275
R Snyder: Detachment cross sections for He^- ions BL8
Snyder R: *see* Bates D R BL159
Snyder R: *see* Bates D R B642
Solt G: *see* Kollar J B329
Soto-Montiel: *see* Read F H BL15
Spoden W: *see* David R B897
Springett B E: *see* Harrison H R B908
Srivastava G P, Gautam H O and Kumar A: Microwave pressure broadening studies of some molecules B743
Stacey D N: *see* Carrington C G B417
Stagat R W: *see* Hidalgo M B Bl364
Stargat R W: *see* Hidalgo M B Bl371
Starace A F: Absolute line strengths by analysis of Lu–Fano plots with application to excited state transitions in neon B76
Starace A F: Quasi-Landau spectrum of a hydrogen-like atom in a high magnetic field B585
Staudt E: *see* Duweke M BL208
Stebbings R F: *see* Howard J S BL109
Steffan B: *see* Gerber G B1836
Stenholm S: Quantum theory of RF resonances: the semiclassical limit B1650
Stenholm S: Power series expansion for the RF resonance shift BL240
Stenholm S: Saturation effects in RF spectroscopy: III. Mixing of nearly degenerate levels by strong off-resonant fields B1097
Stenholm S and Aminoff C G: Saturation effects in RF spectroscopy: IV. Transverse pumping and Haroche's resonances B2390
Stewardson E A: *see* Ottewell D B2185
Stewart A L: The spin density of the ns^2S states in the lithium isoelectronic sequence BL51
Stewart D T: *see* Gardner A BL262
Stewart R P: The accurate numerical determination of two and three-body dispersion forces B2213
Stevenson J G: *see* Peart B B146
Stock H M P: A note on the theory of the flowing afterglow BL86
Szabo A and Adelman S A: Relationship between the Coulomb and hydrogenic approximations for (r^k) BL193

Tahira S, Nishimura F and Oda N: Energy and angular distributions of electrons ejected from autoionization states in neon by electron impact B2306
Tai H and Gerjouy E: Detailed balance as a check on impact parameter calculations B1426
Tai H: Evaluation of exchange matrix elements in p–H collision B1797

Tait A D: *see* Ellis D J BL233
Tamaru K: *see* Kondow T BL156
Tataru L: *see* Latvamaa E B591
Taylor H S: *see* Csanak Gy B2040
Taylor H S: *see* Csanak Gy B2055
Taylor I R: *see* Bell K L B1228
Taylor I R: *see* Bell K L B2271
Teplova Ya A: *see* Volodyagin Yu S BL171
Testor G: *see* Deleage J P B1892
Teubner P J O, Lloyd C R, and Weigold E: The differential cross section for elastic scattering of electrons from atomic hydrogen BL134
Thareja R K: *see* Mohan M B2660
Thomson J E: *see* Sanders J H B2178
Thulstrup E W: *see* Andersen A BL211
Toennies J P: *see* David R B897
Trajmar S: *see* Hall R I BL264
Tran Minh Fr: *see* Manguelle Dicoum E BL27
Tripathi A N, Mathur K C and Joshi S K: On the polarization of the resonance lines of lithium and sodium atoms by electron impact B1431
Tripathy D N: *see* Csanak Gy B2040
Tsapline B: Relation d'incertitude et theorie des perturbations BL131
Tsukada N and Ogawa T: Saturation effect in RF spectroscopy for transverse optical pumping B1643
Tsukada N, Murakami Y and Ogawa T: Saturation effects of transverse resonances in optical pumping experiments B2605
Turner-Smith A R, Green J M and Webb C E: Charge transfer into excited states in thermal energy collisions B114
Tushaev Yu A: *see* Volodyagin Yu S BL171
Tweed R J: Double ionization by electron impact: I. General theory B259
Tweed R J: Double ionization by electron impact: II. Calculations of cross sections for H^-, He and Li^+ B270
Tweed R J: The second Born approximation for ionization B398
Tweed R J: Excited state wavefunctions for helium B770

Vanderpoorten R: *see* Joachain C J B622
van de Runstraat C A: *see* Govers T R BL73
Veseth L: Hund's coupling case (c) in diatomic molecules: II. Examples B1484
Veseth L: Hund's coupling case (c) in diatomic molecules: I. Theory B1473
Vetter R: *see* Brochard L BL145
Volodyagin Yu S, Dmitriev I S, Nikolaev V S, Tushaev Yu A and Teplova Ya A: On the analysis of unresolved inelastic energy loss spectra in ion–atom collisions BL171
Volonte S: *see* Deicrois A BL4
Volonte S: *see* Gabriel A H B2684

Waber T J: *see* Walker T E H B1165
Wakeham W A: The binary diffusion coefficient of moderately dense gas mixtures B372
Wakeham W A and Slater D H: Diffusion coefficients for n-alkanes in binary gaseous mixtures with nitrogen B886
Walker T E H and Waber J T: The relativistic theory of the angular distribution of photoelectrons in *jj* coupling B1165
Walker D W: *see* Farago P S BL280
Walker D W: *see* Carse G D B2529
Wardle C E: The elastic scattering of positrons by helium in the close coupling approximation B2316
Watson W S, Lang J and Stewart D T: Photoabsorption coefficients of molecular nitrogen in the 300–700 Å region BL148
Watson K M: *see* Chen J C Y B965
Watson W S: *see* Gardner A BL262
Walters H R J: Electron scattering by Li, Na, and K in the frozen core Glauber approximation B1003
Webb C W: *see* Green J M B1545
Webb C E: *see* Piper J A BL116
Webb C E: *see* Turner-Smith A B B114
Weigold E: *see* Teubner P J O BL134
Wells W E: *see* Deloche R B1881
Wells J: *see* Dubau J BL31
Wells J: *see* Dubau J B1452
Wendin G: Collective effects in atomic photoabsorption spectra: III. Collective resonance in the 4d shell in Xe B42
Williams A R: *see* John T L BL255
Williams B: *see* John T L B1814
Williams O M: *see* Haydon S C B227
Williams O M: *see* Haydon S C B1856
Williams O M: *see* Haydon S C B1866
Wilson J E: *see* Ottewell D B2185
Winters K H, Clark C D, Bransden B H and Coleman J P: The use of second order potentials in the theory of scattering of charged particles by atoms VI. Elastic scattering by hydrogen and helium atoms BL247
Winters K H: *see* Nicholls P S BL252
Wintschel W: Harmonic oscillator integrals B527
Wolter H: *see* Moore C F BL124
Woods C W: *see* Kauffman R L: B2198
Woolley R G: A comment on 'the multipole hamiltonian for time dependent fields' BL97
Woolings M J and M R C McDowell: Collisions of fast electrons with helium: III. Excitation of the $(1s, nd)^1D$ and $(ns, np)^1P$ states B450
Woolsey J M: *see* Beyer H-J B1849

Zgorzelski M: *see* Gryzinski M B2292
Zivanovic Dj: *see* Amusia M Ya B1028

BLANK
PAGE